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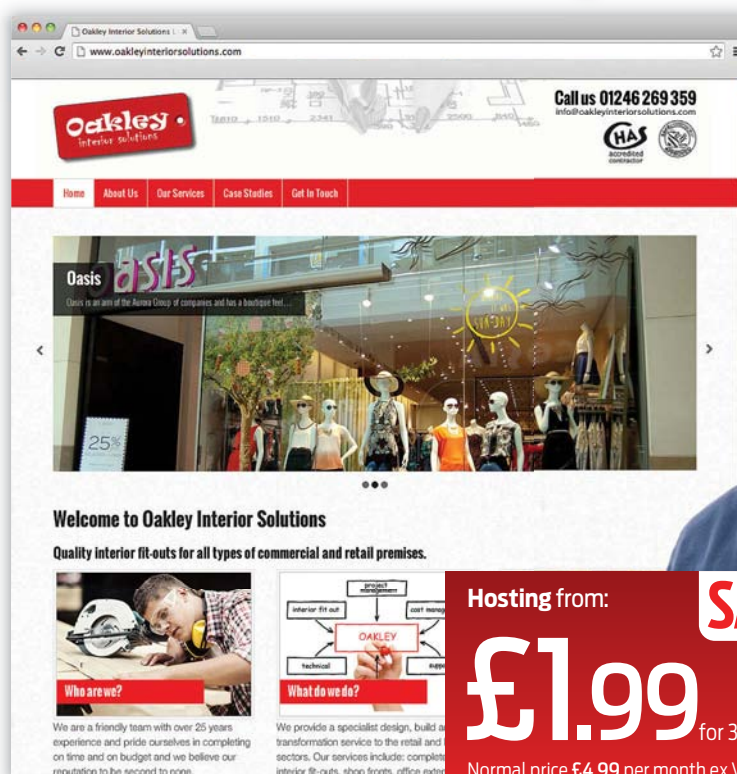
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JIM
MARTIN



Why I won't switch to Windows Phone

Windows Phone would be a great rival to iOS and Android, if only it had some decent apps

Having spent the best part of the past month using the Lumia 630 (page 44), I can honestly say I'm impressed with Windows Phone 8.1. Whether or not you're a fan of the bright colours and live tiles, it deserves credit for its wealth of new features, including Cortana.

We take an in-depth look at Siri, Google Now and Cortana in our artificial intelligence and digital assistant features on pages 88 and 91. Suffice to say that Cortana is surprisingly capable. It can monitor your email for information such as travel details, and warn you of problems such as traffic jams to avoid missing check-in.

I particularly like the way you can personalise the interface with an accent colour and choose the size of each of the home screen icons. Plus, the home screen isn't a place only for app shortcuts: you can pin individual contacts or tasks such as creating a new document in OneNote.

When you factor in Nokia's own updates (Lumia Cyan) and some useful, easy-to-use apps such as HERE+ Drive and Nokia MixRadio, Windows Phone is a compelling alternative to iOS and Android.

Inevitably there are a few areas where Windows Phone lags behind Android and iOS, and until Cortana is available in UK English you won't be able to use it or any of its associated features.

However, there's a much bigger issue: apps. Microsoft is keen to shout about big numbers, but rather less eager to promote quality over quantity. There may be over 200,000 apps in the Windows Phone Store, but I'd challenge anyone to name 10 of them.

One of the problems that needs fixing is that of half-baked third-party apps, which have been created to fill the void where official apps should be. There are no Google apps, nor a Dropbox client. Even where there are official apps, they tend to be lesser versions than their iOS- and Android counterparts. For example, you can install BBC iPlayer, but you can't download any programmes. That sucks.

While there are alternatives for email, maps, cloud storage and more, I've no way to sync my Fitbit One, nor control my Nest thermostat. Developers simply aren't prioritising Windows Phone, and until decent apps exist I have no choice but to use Android or iOS.

I really want to like Windows Phone, and there are some great handsets out there (not the 630, unfortunately). But while there are affordable Android alternatives, there's really no reason to pick Windows Phone. ☒

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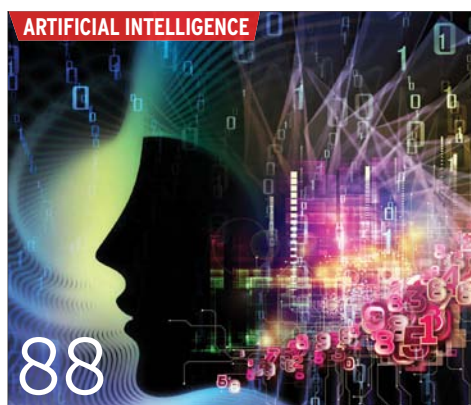
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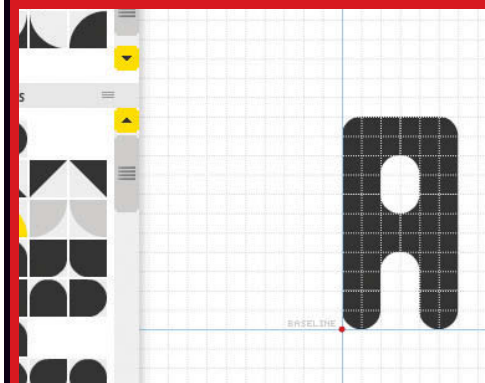
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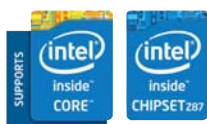
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GOOGLE I/O 2014 ROUND-UP

All the announcements from Google's I/O, from Android L to Google Fit and everything in between

This year's Google I/O wasn't as dramatic as the I/Os of yesteryear. Nobody jumped from a blimp with a radical new face computer strapped to his face, and Larry Page neglected to step foot on stage, much less wax poetic about the infinite sadness in the world. But despite the lack of theatrics, this year's I/O was still pretty exciting, thanks to the glimpse Google offered us into its future.

The tech giant unleashed a slew of updates, synergies and even whole new platforms designed to weave computing into our everyday lives in – Google hopes – a seamless way. Here's a look at everything announced at Google I/O.

Upgrades for Android

First up was Android L, the successor to Android KitKat. The most blatant thing about Android L hits you right away: it's so pretty. Google's introducing a new aesthetic dubbed Material Design in Android L, with a focus on object depth and animation. The beauty is more than skin-deep, though: Android L's bringing handy-looking improvements to the way the system handles notifications, along with an intriguing 'personal unlock' feature that

does away with the lockscreen if you're already carrying another device that can provide authentication wirelessly.

Android L also boosts the OS's graphical and battery performance, ditches the stodgy old Dalvik runtime powering Android for the new and improved ART (Android Run Time), and adds more than 5,000 APIs for developers. While the launch is still months away, a developer preview is available now (see tinyurl.com/oce8buf).

Sundar Pichai, the boss of Android, Apps, and Chrome for Google, also revealed a new initiative dubbed Android for Work, which aims to bolster Android's security and business chops. As part of that, Pichai announced native Microsoft Office integration for Google Drive in Android. Previously, editing traditional Office files in Google Drive required a messy conversion process that was far from seamless. Android L will let you open spreadsheets, documents and presentations files without fuss. Proper mobile support for Google Slides is also incoming.

Pichai also announced an endeavour called Android One, designed to bring low-end phones to emerging markets – and boost Android's share of the market.

Android all around

Android's bursting beyond smartphones these days, though – a fact clearly evident during the Google I/O keynote, where specialised versions of Android for wrists, cars and TVs all made appearances.

Google spent abundant stage time showing off Android Wear's capabilities, especially its contextual awareness and integration with Android phones. David Singleton, Google's director of engineering for Android, previewed the watch OS's Google Now-style cards and the gestures and voice commands used to control them, including a much-needed Do Not Disturb mode that tells your wrist to shut up and stop spitting out notifications.

Third-party apps from Eat 24 and Allthecooks were also shown, but the most newsworthy part of the Android Wear announcements had to do with hardware: the Wear-powered Samsung Gear Live was announced, with both it and the LG G Watch available to buy now. (The Moto 360 will follow later in the summer.)

The newly unveiled Android Auto, meanwhile, aims to integrate your 'Droid with your drive in a way that's road-responsible. Android Auto connects

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your phone to your car (via a cable in the onstage demo) and brings your personal apps – such as Google Calendar, Play Music and Maps – to your car's central dashboard, clad in a familiar Android UI but optimised for the car with larger onscreen buttons and voice commands.

Google's also trying to resuscitate the corpse of Google TV with Android TV, yet another stab at establishing a beachhead in your living room. Android TV in essence treats your TV as a bigger screen for Android itself, rather than a whole new platform. While the interface certainly looks slick, the real secret sauce could be Android TV's search features, which draw on Google's deep knowledge repository to provide YouTube clips and information about shows.

Android TV even provided accurate results to a search for 'Oscar nominated movies from 2002' and a vocal query about who played Katniss in *The Hunger Games*. (Jennifer Lawrence, if you're wondering.)

Razer announced a new pint-sized gaming console to match Google's Android TV announcement, which will feature all of Android TV's streaming and TV navigation capabilities, but focus on Android gaming – like a more TV-friendly Ouya.

Chromecast and Chromebooks

It wasn't all Android, however. Various flavours of Chrome also stepped into the spotlight at Google I/O.

The Chromecast streaming media dongle is being updated with some helpful extras. Most notably, you'll be able to enable an option to allow nearby entertainment

junkies to cast to the device even if they aren't on the same Wi-Fi network as the Chromecast itself – a handy addition for visiting friends. Chromecast is also gaining the ability to mirror Android devices on your TV, as well as a 'Backdrop' feature that lets you customise the imagery shown during downtime.

The Chrome OS operating system is also receiving some fresh new features, thanks to deeper integration with Android. Like Android L devices, Chromebook users will soon be able to bypass passwords by using a Bluetooth-enabled Android phone for automatic authentication – merely opening the lid will log you in to both the operating system and your Google account. While paired, notifications for incoming calls and texts will appear on your Chromebook, along with low-power warnings for your phone. Google's also working to allow top Android apps to work on Chromebooks, complete with hardware-level access.

But don't let all the announcements and hardware talk fool you: Google I/O is

primarily a show for developers, and Google revealed some intriguing under-the-hood announcements sure to make devs just as happy as end users.

The Play Games service underpinning Google's gaming endeavours is giving players richer profiles and cloud-based 'bookmarks', which save your in-game progress alongside a screenshot – although it's not clear how it differs from the cloud saves already available to players (and underused by developers). Developers will also be able to create daily Quests, complete with potential in-game rewards.

Shifting gears, health is the buzzword of the day, and Google's jumping on the bandwagon while playing to the potential strengths of Android Wear devices with the launch of Google Fit, a new platform designed to allow your disparate fitness apps and devices to play nice together. In essence, Google Fit lets fitness gear and software share data with each other, and Google's already signed up a small army of partners for the platform.





Google looks to autonomous cars

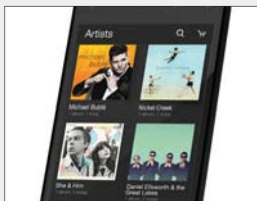
The next step for Google in its determination to create a fully autonomous car is one with no steering wheel and pedals. Google's prototype looks like a simplified Herbie the Love Bug, with a cunning LiDAR hat on top, round, friendly, faux headlights for eyes, what looks like an adorable cluster of sensors for its nose, and a broad smile where a radiator might be. Inside is space for two people, a few possessions and a display to show the car's planned route.

MORE: tinyurl.com/mgzh73v

ITV Player hits Roku players and Now TV

The ITV Player catch-up streaming service is now available on Roku players and Sky's Now TV Box. Owners of a Roku box or Now TV Box can now access ITV shows from the past 30 days. Support for the Google Chromecast is yet to be confirmed.

MORE: tinyurl.com/m9hhjzc



Amazon launches first smartphone

In what is probably the worst-kept secret in tech history, Amazon has launched its first smartphone, the Fire Phone. The bad news is the Fire phone is for US customers only, locked to the AT&T network.

MORE: tinyurl.com/qxgd5k2

EE TRIALS VOICE CALLS OVER WI-FI AND 4G

EE investing £275m to allow calls and texts over Wi-Fi and 4G connections

As part of its £275m investment into voice EE is trialling voice calls over Wi-Fi and 4G in the UK. It hopes to launch calls over home-, office- or public Wi-Fi this autumn.

EE says that Wi-Fi calling will offer higher quality and better reliability than VoIP. However, customers will need compatible smartphones to take advantage of the service.

Fotis Karonis, CTO at EE, said: "This is a major part of our strategy to invest in giving customers the ability to make a call wherever they are, and we're confident that this service can make a big difference to people in homes and large offices across the country, especially in the most rural areas, which don't have mobile coverage."

The network said that users will be able to make calls and send text messages through the native apps for those tasks.

EE will begin trialling the so-called VoLTE later this year using the 800MHz spectrum. It will expand data- and voice coverage, bringing service to a previously unconnected part of rural Oxfordshire.

The firm said a full launch will take place in 2015 once the technology has had a chance to mature and EE's 4G network exceeds 90 percent coverage.

"4G calling, or VoLTE, is an exciting technology that we're going to be trialling in the coming months using our low-frequency spectrum, bringing one of the world's best voice- and data services to a part of rural Britain that has previously been unconnected," added Karonis.

Broadband for non-mobile customers

Previously available only to its mobile customers, EE has opened its home broadband service to anyone in the UK. The mobile operators cheapest deal is £2.50 per month for the first year, with download speeds up to 17Mb/s.

Traditionally the first year would be half price, but this is almost a quarter of the usual monthly cost of £9.95. If you need faster downloads, a 38Mb/s fibre service is available for £5 per month for the first three months; £19 thereafter.

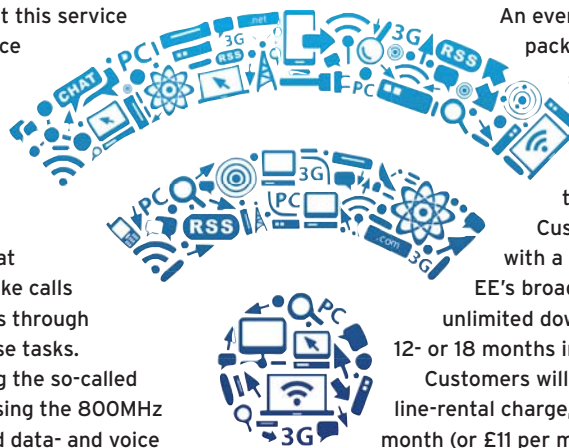
An even faster fibre broadband package is available from £15 per month. Once again, that price is valid for three months and will then jump to £29.

Customers will be provided with a Bright Box router. All EE's broadband packages include unlimited downloads and are either 12- or 18 months in contract length.

Customers will also have to pay a line-rental charge, currently £15 per month (or £11 per month if you pay an annual- rather than monthly subscription).

Ewan Taylor-Gibson, broadband expert at uSwitch.com, said: "EE widening its broadband offering to all should give the market a shake up, particularly with the lure of perks such as two-for-one cinema tickets and Pizza Express vouchers on top of very competitively priced broadband."

"EE's going for the jugular with its £100 buy-out promise. People unhappy with their current service but locked into a contract will be able to wriggle out of it - with EE footing the bill."



Short .UK web domains now available

How to register a .UK web domain for your business- or personal website

The .uk domain is now live, and Stephen Fry was among the first to make the switch. UK domain registry Nominet said 93 percent of users prefer the .uk domain over alternatives such as .london.

Nominet expects the new domain will appeal to "tech-savvy entrepreneurs" and startup businesses wishing to tap into positive "brand UK" attributes.

If you want to register a .uk domain and are not already the owner of a .co.uk or other UK domain you may have to wait till 2019. If you registered such a domain before 10 June, a .uk domain may be reserved for you until 10 June 2019.

If the address is not already registered with a .co.uk, .org.uk or .me.uk domain then you should be able to register it straight away.

"The new .uk is for people who want a short, memorable domain with the popular and trusted .uk ending. We know this combination appeals to our tech-savvy, digitally-engaged population," said Eleanor Bradley, chief operating officer at Nominet.

The firm said more than 10 million existing UK domain holders will be offered first choice on the shorter equivalent. The wholesale price for .uk is the same as .co.uk: £5 for two years. ☐

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Blackshades: Police crackdown

Blackshades is a nasty form of creepware that can remotely take control of a computer and give hackers a dangerous amount of access to your data. We examine the fallout

The National Crime Agency recently announced the successful execution of an unprecedented, nationwide operation that saw 17 cybercriminals arrested across the United Kingdom. In an official statement, the Agency reported that a week of arrests, searches and seizures had involved nearly every UK Regional Organised Crime Unit (ROCU), as well as Police Scotland and the Metropolitan Police.

The operation was part of a global effort, headed by the FBI, that involved 19 different countries, and resulted in over 90 arrests, all related to the criminal use of a malicious software called Blackshades. This nasty creation belongs to the malware subset known as creepware, and enables hackers to remotely access a victim's computer, control its webcam to take pictures without them knowing, access and download files, plus steal usernames and passwords. Hackers don't even have to know much about the basics of coding to be able to use the software either, as the Blackshades suite is one of the many malware tools that are sold online through forums and secret sites.

Security specialists Symantec reported Blackshades as being a popular and powerful Remote Access Trojan (RAT) that's used by a wide spectrum of threat actors, from entry-level hackers right up to sophisticated cybercriminal groups. Blackshades was sold on a dedicated website, bshades.eu, for US\$40-\$50. Competitively priced, with a rich feature list, Blackshades provides the attacker with complete control over an infected machine. A simple point-and-click interface allows them to steal data, browse the file system, take screenshots, record video, and interact with instant messaging applications and social networks.

This particular creepware first came to public prominence in the United States last year when the then Miss Teen USA, Cassidy Wolf, reported that she'd been sent an anonymous email which stated the sender had naked pictures of her, secretly captured by her own computer which had been infected with Blackshades, and that they would be posted on the web unless she sent more illicit images to the attacker. This particular case ended with the hacker, Jared

James Abrahams, being imprisoned for 18 months, but it effectively highlights the potential worrying threat that Blackshades poses to unwary users worldwide.

The National Crime Agency revealed that the creepware was disturbingly easy to deliver to a victim's machine, explaining that: "People are typically infected by clicking on external links on social networking and communication platforms. Instead of viewing a picture or video, the victim unwittingly installs the malware. In many cases, those affected will have no idea they're infected."

Its accessibility and low-cost entry point means that Blackshades has achieved widespread use, with the FBI estimating that it was sold and distributed to thousands of people in more than 100 countries and has been used to infect more than half a million computers worldwide.

The NCA also reported that about 200,000 usernames and passwords of victims across the world may have been extracted by Blackshades users in the UK.

Symantec reported that Blackshades wasn't limited to ogling and blackmailing

MARTYN
CASSERLY

young beauty queens, either. "Organized cybercriminal groups have netted millions of euro in well-organized attacks, transferring large sums of money using Blackshades infected computers," its blog read.

"In a recent operation dubbed Francophone, Blackshades was used as part of a sophisticated social engineering scheme to target French companies in financially motivated attacks. Total financial losses involving Blackshades activity would be hard to accurately gauge. However, individual cases indicate they are significant.

"Blackshades was also seen in politically motivated attacks during The Arab Spring. Political activists were targeted in Libya and Syria during the uprisings with one variant..."

The originators of the software are thought to be US citizen Michael Hogue and Swedish national Alex Yucel. Hogue had already been arrested and has subsequently admitted his guilt, while Yucel was detained in Moldova and is awaiting extradition. Yucel drew particular attention from the authorities due to his commercialisation of the Blackshades software.

"Yucel ran his organization like a business," the FBI reported. "He was hiring and firing employees, paying salaries, and updating the malicious software in response to customers' requests. He employed several administrators to facilitate the operation of the organization, including a director of marketing, a website developer, a customer service manager, and a team of customer service representatives."

This isn't uncommon in the current trend of security breaches, where enterprising hackers will develop software and then sell it on rather than use the exploits themselves. It's a viable business as long as they can evade the authorities, something that might be harder to do now that governments are responding to the increasingly dangerous attacks that these suites can enable.

"This was a superbly co-ordinated policing response to a specific emerging cybercrime threat," said National Policing lead on e-crime, Deputy Chief Constable Peter Goodman, "It demonstrates the determination of the National Crime Agency, its partners overseas and the UK's newly

established regional cybercrime units to identify, trace and disrupt those whose potential criminal activity presents a threat to the public's lawful use of the intranet.

"It also sends out a clear message that we have the technology, capability and expertise to track hackers down, and should, I hope, reassure the public that the police will respond effectively to the reports we receive about the criminal use of computer networks and malware to by-pass security measures we rely on to keep our personal data safe."

By the time you read this, all of the security software suites should have detection enabled for the specific file types and executables that the malware uses, so, as always, ensure that your versions are up to date and that any patches are applied.

Blackshades isn't the only creepware out there, and more will be on the way. In the meantime, the best way to protect yourself is still to think before you click on links, don't download anything from unfamiliar sites, and maybe consider the fact that when you're using your computer for everyday tasks, the camera just might be watching you. ☒

The right to be forgotten

Will everyone soon be able to delete their online footprints?

On 13 May 2014 the European Union's court of justice ruled in favour of Spaniard Mario Costeja González in his case against Google; it's decision could have substantial repercussions for the search giant, alongside many other tech companies.

The core issue of the case revolved around an individual's right to be forgotten online, and the responsibility that a search provider has to ensure this is protected.

Up until the ruling, if there was information about you on the web, chances are, it would remain there forever. You could approach a search company and ask them to remove links to the information, but they were under no obligation to help, although they might agree to do so if the information was damaging and provably untrue.

Now the court has decided that 'An internet search engine operator is responsible for the processing that it carries out of personal data which appears on web pages published by third parties'. This means that linking to information about someone who has expressly asked for it to be removed would become illegal.

González's fight relates to an event over fifteen years ago when it was reported in two 1998 editions of the Spanish newspaper *La Vanguardia* that his house was up for auction in order to recover social security debts he had failed to pay. González argued that the high-profile nature of the newspaper would mean that search results on his name would always return with the story ranking on or very near the top - even though the debt had been paid and the issue resolved. While the court ruled that *La Vanguardia* had been perfectly within its rights to initially publish the story, Google's links to it should now be removed as they compromised his right to privacy.

Setting a precedent

This sets a precedent where normal people can exercise far more control over the information that people access about them online. The new ruling doesn't mean, however, that anything written about someone can be removed - there is still an allowance for information deemed to be in the public interest - but it does state that in any case where 'the data appear to be inadequate, irrelevant or no longer relevant, or excessive in relation to the purposes

MARTYN
CASSERLY



for which they were processed and in the light of the time that has elapsed' links to it should be erased at the users request.

If the search provider doesn't comply with the user's request then the individuals are instructed to bring the complaint before their local judicial authority, who would evaluate the case and take action against the provider on their behalf.

ISPs and Search providers have long argued that they aren't responsible for any content on the web, merely providing a method by which it can be found. There are also examples where sites involved in illegal activity are delisted at the request of law enforcement organisations, but this instance is different, as the information itself might not be unlawful or inaccurate, just potentially harmful for an individual due to the way in which it is collated and presented. With so many aspects of life now conducted online, it stands to reason that employment, relationship, or business prospects could be compromised unfairly with a simple Google search.

The ruling explained this by stating that 'The effect of the interference with the person's rights is heightened on account of the important role played by the internet and search engines in modern society, which render the information contained in such lists of results ubiquitous. In the light of its potential seriousness, such interference cannot, according to the Court, be justified by merely the economic interest which the operator of the engine has in the data processing.'

These economic interests could certainly suffer if Google was to receive a large amount of delisting requests, each of which it would need to explore and act upon.

Currently, much of the web cataloguing for Google's index is handled by automated software, but it would be difficult to evaluate these new personal detail requirements with those tools. It stands to reason that staff would need to be employed, with the inherent costs involved.

A more drastic scenario could be that Google and other search companies

relinquish their European offices and return to countries where the ruling doesn't apply.

Keeping schtum

So far Google has kept quiet counsel about its intentions, but did release the following short statement. "This is a disappointing ruling for search engines and online publishers in general. We are very surprised that it differs so dramatically from the Advocate General's opinion and the warnings and consequences that he spelled out. We need time to analyse the implications."

The mentioned Advocate General was Niilo Jääskinen, who issued a report from the same European court of Justice back in June 2013. In this, he examined the more technical notions of where the data was processed - Google say it was on its US servers, with the Spanish office mentioned in the case merely being used to organise advertising - and of whether a 'right to be forgotten' was actually applicable to a search engine provider. Jääskinen's opinions seem to have had little influence over the final verdict and the contrast of the ruling will have come as a hammer blow to Google.

Jeff Jarvis, professor of Journalism and author of the book *What Would Google Do?* tweeted his dismay saying that the 'EU's 'right to be forgotten' ruling was a blow against free speech', but was challenged by Swiss Futurist Gerd Leonhard who replied: "Everything that happens must be known" - is that what you are proposing? I think the EU's decision is a suitable first step."

Such is the growth of social media, mobile technology, and sophisticated search capabilities, that the implications of its use are still being discovered.

In real life, we can make mistakes and eventually live them down, but online they follow us wherever we go. There are no new towns to move to and start again. Maybe this ruling will help rectify that. ☒



5 ways to switch off when you are always on...

If you want, you can always be connected by phone, email, IM, social media and more. But what do you do if you need to switch off? For many of us, simply pulling the plug isn't really an option

Ubiquitous connectivity and the rise of portable computing devices mean that personal communication has never been easier. If you want to be, you can always be connected via phone, email, IM, social media and more. At the same time, the UK has developed into an economy where revenue is generated by ideas and services rather than actually making stuff.

This combination means that for some people 'work' is no longer a place to which we go, it's a thing we do - all the time.

This can be a good thing: adding flexibility to busy lives, allowing people to work from the commute and the school run. In principle, this should save time for fun and relaxation elsewhere. Of course, the reality is that many of us are slaves to our smartphones, checking them last thing at night and first thing in the morning, and allowing time for very little else in-between. This isn't an efficient way to work or a nice way to live. And it's a sure fire way of burning out.

Here are a few golden rules that will help you to use mobile technology to stay connected and efficient, energetic and sane:

1. Triage on the train; answer at leisure

You receive a message, it makes you angry or excited (probably angry) and you start immediately typing a reply. This isn't a good use of email in any circumstance.

For one thing, a text message is never an emergency, and your first response is hardly ever as valid as a considered appraisal of what is, after all, an electronic letter.

But if you received the message on your smartphone while watching your daughter's school play, an immediate reply is definitely not a good idea. Get into the habit of using your smartphone, tablet or laptop to check messages at set times. But break the habit of replying immediately. Rare is the email that requires an immediate response.

By all means, check email on the train to and from work. Leave marked as unread

messages to which you need to give a response, but don't respond until you have the time and are actually working. Then, use the appropriate medium. Speaking of which...

2. Take it off email (and train your colleagues to do the same)

Email and text-based messages can be a brilliant time saver and efficiency tool. But they can also be a time sink, and in the wrong hands, a passive-aggressive weapon of mass irritation. Many conversations are best held either in the room or over the phone, but this requires some discipline and training of your colleagues to do the same.

If, as you check your email one evening, you see that a colleague has copied you in on a thread just so you can see that they are annoyed about the way someone is behaving, you have three choices. Reply to the email, ignore the email, or wait until the morning and talk to them. You know the correct approach, and it's definitely not option one.

As often as possible, make a note to respond to emails, but respond in person. The face-to-face interface is a lot more efficient than firing off messages back and forth. And if you refuse to engage in email conversations that are better taken offline, you'll soon find that people take the time to speak to you. Plus you aren't spending your evenings furiously typing.

3. Have a smartphone curfew

A senior colleague of mine switches his phone off at 8.30pm every evening, and refuses to sleep in the same room as his phone. All his colleagues know this, and none of them thinks he's a disgraceful slacker.

The point is that this habit of checking messages last thing at night and first thing in the morning is very bad for your health, and not great for your efficiency. You won't sleep well if you don't give yourself time to disconnect before bedtime. And you'll be a much more successful operator at work if you're rested and enthused.



MATT EGAN



4. Do disconnected things you love

As the man in the terrible advert used to say: it's not all work, work, work! You'll be a far more efficient colleague and employee if you take time to do things outside work, that take you away from your always-on smartphone.

One of the key reasons I play sport is that if I'm on the golf course, you can't reach me. (Golf doesn't do much for my anger -



but counting backwards from 30 in threes is supposed to help.) Take a walk, cook a nice meal, visit a gallery or listen to music. Whatever you love to do, do it as regularly as you can and make sure you can't be reached while you do so.

Nobody will think you're lazy, everyone will appreciate your Zen-like calm. And work will still be there when you finish.

5. Set house rules; stick to them

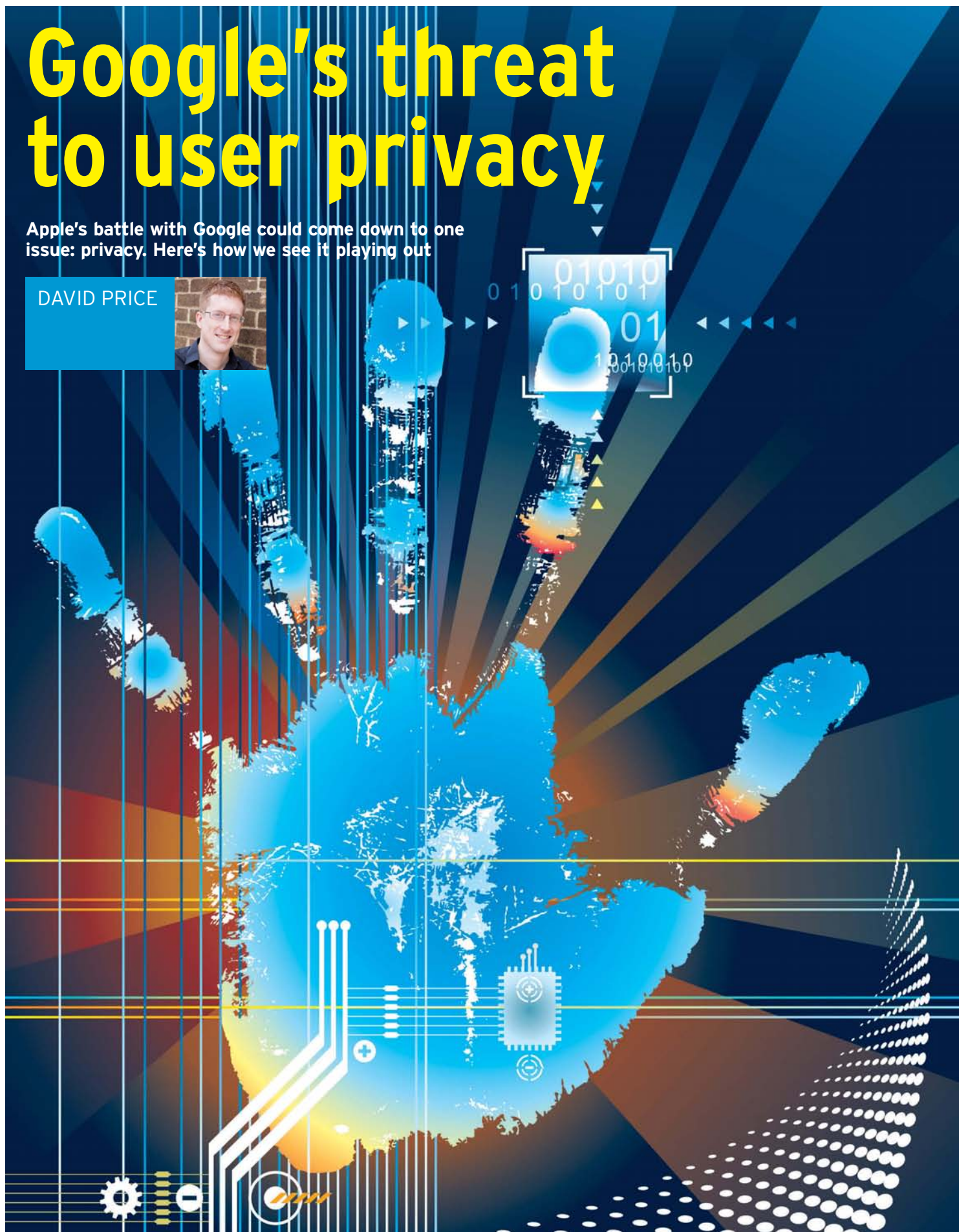
Of course, you can't spend five hours on the golf course every day. (You can't, I've tried.) For most days of your life you'll be chiefly working, feeding and sleeping. But you can still ensure that for key moments of the day you're switched off and focused on what's going on around you, rather than waiting for the demanding ping of an incoming email.

This is especially appropriate if you have small people in the house. When dinner is on the table, phones should be off or out of the room. Try it - even if you're just having a conversation, playing a game or watching a movie. Your messages will still be there, and every bit as urgent, in an hour's time, but your ability to deal with them efficiently and calmly will be greatly enhanced. ☒

Google's threat to user privacy

Apple's battle with Google could come down to one issue: privacy. Here's how we see it playing out

DAVID PRICE



I'm an Apple fan, so I'm probably biased. But here's how I view the two great tech companies of our era. Apple makes great products and sells them for a lot of money; Google makes great products and gives them away for free, then sells its users' data for a lot of money.

Simplistic, of course. Unfair on Google? Possibly. But it's certainly true that Apple is more old-fashioned in its attitude to user privacy, as the company's executives were keen to point out at WWDC 2014.

Safari in iOS 8 and OS X Yosemite, for instance, will offer the ability to run searches using DuckDuckGo, a Google-rivalling search engine whose selling point is it doesn't track user data. Safari will add per-tab private browsing. And the interplay of data between apps in iOS 8 will, we were told, be strictly mediated by the OS infrastructure to ensure that nothing is leaked. It's hard to imagine Google talking up similar features.

Google's war on privacy

By contrast, Google has been dogged throughout its history by accusations of anti-privacy behaviour. It's been criticised for too readily handing governments information about their citizens (yet conversely, bowing to political censorship requests); prohibiting anonymous or pseudonymous accounts on Google+, YouTube, Gmail and other Google services; installing cookies with a lifespan of 32 years; refusing to offer a Do Not Track feature far longer than any other major browser maker; harvesting data from (unencrypted) private Wi-Fi networks across 30 countries without permission; and on the launch of Google Buzz making Gmail users' contact lists public by default.

I could go on, but suffice to say that in 2007, Privacy International gave Google its lowest possible ranking: 'Hostile to Privacy'.

And it gets better. In early June, Google made an acquisition that received far less attention than Apple's purchase of Beats, or Google's absorption of Nest in January. But in terms of privacy, it could be significant.

Skybox Imaging runs a network of high-definition, state-of-the-art satellites, and uses them to collect and analyse micro-geographical and human data: from the number of empty spaces in a supermarket's carpark (and by extrapolation, its estimated revenues) to the movement of protesters in Ukraine. And its cameras are far more powerful than the industry standard only a few years ago. According to Clive Evans, lead satellite imagery investigator with LGC Forensics, they're powerful enough to make out what's on your desk from orbit. This kind of eye-in-the-sky snooping is known as 'manhole and mailbox' resolution.

Again, it's possible that my (hopefully reasoned) allegiance to Apple makes this a

biased opinion. But I am disquieted by the idea of such inescapable surveillance tools being put into the hands of a company whose CEO once said: "If you have something that you don't want anyone to know, maybe you shouldn't be doing it in the first place".

It's true, admittedly, that many of the practices which have earned Google the ire of privacy watchdogs are not unique to the company – such as its habit of using the content of Gmail messages to issue targeted advertising, a strategy also employed by Hotmail and others. But no other company possesses such a diverse network of data-led technology services. No other company has the power to so effectively track users across the full range of online activities.

And privacy is going to become increasingly important as tech customers get savvier about the value of their data.

In an interesting piece about the need for diversification on stratechery.com, Ben Thompson highlights the underwhelming growth Google is seeing in its AdSense business, and tentatively relates this to the increasing resistance to advertising (and, I would add, awareness of privacy issues) among internet users – something related, perhaps, to the generations coming through

would depend on offering something different, and on presenting a solution to the problems people are starting to see in that area. One of the most obvious downsides to wearables is the potential loss of privacy. Google Glass would be a goldmine for opt-out, data-driven advertising, and it's hard to imagine Google being the company to say no to a lucrative revenue stream. The same looming threat (albeit in a milder form) hangs over smartwatches, too.

But an iWatch, or any other Apple wearable product, would surely be a different proposition entirely. Apple loves to tie consumers into its ecosystem, of course, and we'd expect tight integration between the iWearable and the user's other Apple devices, their Apple ID and account, and presumably iCloud, too. But the company guards its ecosystems, locking them down air-tight. Which seems like, well, A Good Thing.

The other side of things is Apple's tighter product focus. While Google pushes ever further into the wider reaches of bleeding-edge consumer tech – wearables, self-driving cars, home automation, high-altitude balloons – Apple has remained focused on its core areas. Laptops. Desktops. Smartphones. Tablets. iWork. iLife. It has Safari, but Apple

“Apple is one of the few companies left operating a business model that allows it to respect user privacy without damaging its bottom line”

who have been raised on computers. Google, it would seem, faces a battle to convince the general public that it can be trusted.

Apple: the user's champion?

Which is where Apple comes in. Silly old Apple with its physical products and its goods-for-actual-money commercial transactions. Apple and its respect for the user. Apple and its revenues that aren't dependent on advertising.

I believe that Apple under Tim Cook is an ethical company: whether you agree with them or not – as it happens, I do – the firm's stances on climate change and gay marriage suggest it will do what it thinks is right regardless of the commercial risks. But more than corporate ethics, privacy is about business models, and Apple is one of the few companies left operating a business model that allows it to respect user privacy without harming profits. If anything, Apple's revenues are dependent on happy, loyal users.


We're still waiting for Apple's first foray into the wearable technology space, but I've said more than once that the key to its success there (with an iWatch or otherwise)

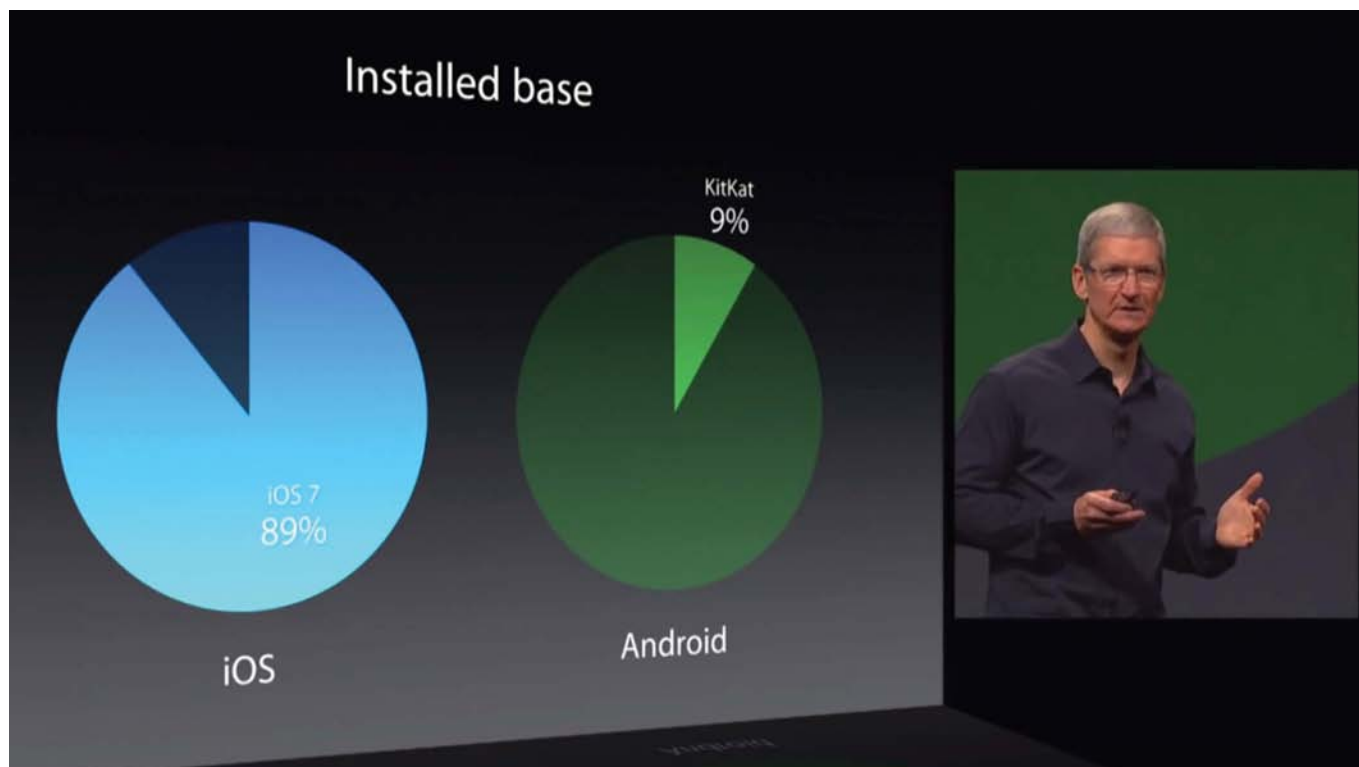
doesn't have the same data network to draw on: no search engine or social network, no YouTube or Nest usage stats. Apple's tentacles don't reach far enough to present the same threat to user privacy.

The end of privacy

Apple's Google-defeating strategy is clear: talk about privacy, respect privacy, protect privacy. Of course, all of this assumes that privacy is something that people care about.

One other future is prophesied by my colleague, Matt Egan. "If the internet has taught us anything, it's that people will sign up to just about anything as long as it's free," he writes. "And if the price we pay for things we like is loss of privacy, it's a price many of us are happy to pay."

There's something appealingly binary about all this. Apple and Google, the major players of our time, are as different as night and day – expensive, beautiful hardware and the sealed user experience, versus free, beautiful, integrated online services and compromised privacy – and the outcome of their battle will give us an idea of what we all want from technology, if we're honest. 



Apple takes a dig at Android... but steals key features for iOS 8

Imitation is the sincerest form of flattery. When it comes to mobile operating systems this seems doubly true – as Apple's new iOS takes 'inspiration' from many of Android's features

At its WWDC (worldwide developer conference), Apple took time to have a dig at its major rival in the mobile market, Android. However, the firm also announced iOS 8 which appears to take many key features from Google's OS.

Apple CEO Tim Cook, and many of the audience at WWDC (presumably most are fans of Apple) spent a decent amount of time putting Android down while having a good laugh at it. It seems a little low and unlike Apple to take cheap shots at rivals instead of focussing on how good its own products are.

The firm honed in on two key elements of Android: adoption rates and malware. The malware one was way off the mark the way I see it, claiming that Android makes up 99 percent of the mobile malware market – but this is far from the whole story.

F-Secure's recent report on malware across iOS, Android, Windows Phone and BlackBerry did indeed find that Google's OS accounted for 97 percent. Yet, this is from small, unregulated third party app stores predominantly in the Middle East and Asia. If you look at the Google Play Store the figure is only 0.1 percent. Cook either didn't do his

CHRIS MARTIN



homework or decided to conveniently leave and that bit of the presentation.

Cook also took pleasure in pointing out that iOS has a much higher adoption rate than Android – an 89 percent install base for iOS 7 compared to nine percent for Android KitKat. Admittedly, this is an area where Apple is better, but it only has a handful of different phones so the job is easier.

While Apple joked around at how poor it thinks Android is, what I find more interesting is the way in which iOS 8 now contains many new features which have been around on Android for a while, if not longer.

Saying "Ok, Google" is the latest way to start a Google search on Android smartphones and tablets, and Apple has now decided to allow users to say "Hey, Siri" to activate its own digital personal assistant.

Moving on. Now iOS 8 includes widgets for the notification areas and these are a

core part of the Android system, allowing users to get information from apps without actually opening them. Although they don't sit on the home screen like Android, it's a very similar concept.

A while ago, Apple copied Android's drop-down notification bar, which has now made its way on to Windows Phone. Well, iOS 8 now includes actionable notifications which, you've guessed it, have been on Android for a good while. iOS 8 users will be able to take control of their iPhone from a Mac which isn't a part of Android as standard, but has been available via apps for years.

One of my biggest complaints about the iPhone and iPad is the keyboard and the lack of swipe gesture typing. This is finally changing with iOS 8. So while I'm glad that it's an improvement, my point is that it's yet another feature which has been around on Android for a long time. There are more, including iCloud Drive which lets you store any document or file type. Does this sound to you like Apple's version of Google Drive?

All this will improve the iOS experience, but Apple should think twice before bashing Android while copying its features. ☒

Peer to perv

Does an unfiltered internet support artistic integrity and freedom of thought or is its value solely limited to circumventing blocked websites and keeping the pirates afloat?

I've often wondered what it'd be like to have an open and uncensored internet. And thanks to Rupert Murdoch I got a taste of an unfiltered version just last month. That's not a sincere thank-you of course, purely a backhanded compliment. Murdoch's News Corp, and its catalogue of abuses, is one reason why I mourned the passing of my former ISP.

Along with its parent O2 Home Broadband, Be Broadband was sold to Murdoch-controlled Sky in April 2013. You can do your best to sidestep certain companies, as I've discussed previously in my avoidance of Google, but there's always the chance your preferred business will be bought out by another with rather different ethics.

Until Be Broadband was sold to BSkyB, I'd been very satisfied with the service. Be provided me with an ADSL2+ connection that maintained a solid 21Mb/s down and 1.1Mb/s up, with friendly and technically adept staff always available by phone on the few rare instances I did need to chat to them.

But BSkyB was desperate to retain me, along with all the Be customers it tried to buy in its attempt to make Sky Broadband the biggest in the UK broadband industry after BT. When I called to quit, its customer

ANDREW
HARRISON



retention staff offered me discounted £5 a month broadband (down from £18 with Be) and even wanted to throw in free line rental to close the deal. But I already had plans to go a less corporate route and explore what smaller independent ISPs could offer.

In the interest of disclosure, I'm now trialling a business line with one of the UK's most talked-about small ISPs, even if the life peer doing all the talking doesn't really understand the bigger picture.

The internet service provider is Andrews & Arnold, a family-run business based in Bracknell that caters for business users and the kind of geeky customers who like to know the last technical detail of their net connections. It's incidentally also one of the few companies that offers full IPv6 connectivity to the end user.

Earlier this year, Andrews & Arnold drew flak in the House of Lords for allegedly putting the children at risk with its uncensored loosing of the horrors of the interweb to the underaged.

Baroness Howe of Idlicote identified A&A as the example of an ISP that does not filter its internet feeds - which as I understand it, is quite typical for most business lines anyway, whether ADSL, FTTC or full-bore leased line. Maybe A&A became the archetype for untrammelled excess as it also offers a package called Home:1 that's tailored for domestic subscribers.

So there are two main types of internet filtering currently at work in the UK, both troubling in their own way. The first is the barring of direct access to websites that have been deemed to infringe copyright - or more typically, accused of facilitating others' infringement. The classic example here would be The Pirate Bay, which provides links to torrent files for downloading elsewhere through peer-to-peer networks.


Access has been blocked to this and other torrent listing sites, following court orders imposed after a complaint by a media company or its lobby group.

Then there's the so-called porn filters now in place for everyone's home internet at the ISP level. Or are they? As the Baroness knows and has been working to change, there is today no government censorship of adult content on our internets - yet.

What we have in place is a voluntary code of practice, observed by the big four ISPs of BT, Virgin, TalkTalk and Sky. This was pushed onto the ISP industry like an independent choice, with threats from David Cameron to the trade to think of the children, or else face the wrath of statutory legislation.

At its heart is the issue of government control over what you can see and read. Today middle England came for the adult content, but should government-approved filtering boxes get installed at every British ISP, we'll find that other unsavoury URLs are quietly added to the blacklist - religious extremist sites, ex-pat whistleblowers' blogs; later, information on how to challenge the outcome of rigged national elections...

And what does an unfiltered internet look like today? There will be seedy stuff and watering holes for people looking for free downloads. Much the same as that available through the big four ISPs today to anyone with a little circumvention nous.

But for people who'd rather make up their own minds about the world and would prefer that state-approved news doesn't become the only kind of information available to everyone, an internet that's free of state firewalls is a freedom worth preserving. 





Why Amazon's Fire Phone shows that Kindle Fire failed

The Amazon Fire Phone launch tells us that technology's most disruptive company is caught in two minds, says [Matt Egan](#). The Kindle Fire must be failing, and the Fire Phone has started out on shaky commercial ground

In late June, Amazon confirmed the world's worst-kept secret by launching its first ever smartphone. When Amazon chooses to do anything, we watch very closely indeed.

This is, after all, the little book store that did big things. A company that went from book reseller to retail giant, to tech hardware maker, publisher and media company. All without turning much of a profit, leading to a market valuation of around \$150bn (£87bn).

Amazon's founder and CEO Jeff Bezos is, simply, a one-off - a visionary.

Bezos worked out how to sell books online. He then understood that Amazon wasn't a book company, it was a brilliant logistics organisation that could get you stuff the next day.

He also grasped two key truths:

1. People tend to buy more stuff when it's easier to buy products than it isn't.

2. US tech investors don't need big profits to invest in disruptive businesses.

Hence, Bezos is a rich man and you should pay close attention when Amazon decides to launch a new product.

Disrupting markets since 1994

The Amazon Kindle popularised ebooks and changed the way millions of people bought and consumed reading material. In doing so it took a blowtorch to the business of traditional book sellers such as Waterstones.

And then came the Kindle Fire which reversed the business model for tablets. A consumption device of similar physical calibre to the iPad, the Kindle Fire is a tablet that costs very little to buy. The catch is that you're locked to Amazon's marketplace for books, music, movies and apps. The idea being that in your lifetime of ownership, you'll generate more profits for Amazon than it costs to build your device in the first place.

Game changer

What was most interesting about the Fire Phone announcement was the way it made clear that the model has now changed.

To recap: Kindle Fire is cheap to buy, and Amazon makes its money from the apps and media you buy. The idea is that

the cheapness of their device leads to volume of sales, which is where a low-margin business such as Amazon makes its money.

But the Amazon Fire Phone is expensive for a handset with mediocre specs. It's a 4.7in smartphone with what's now a middle-of-the-pack display. The processor and RAM are what you'd expect for a high-end smartphone, and the only feature of note is the pseudo-3D effect created by the four front cameras.

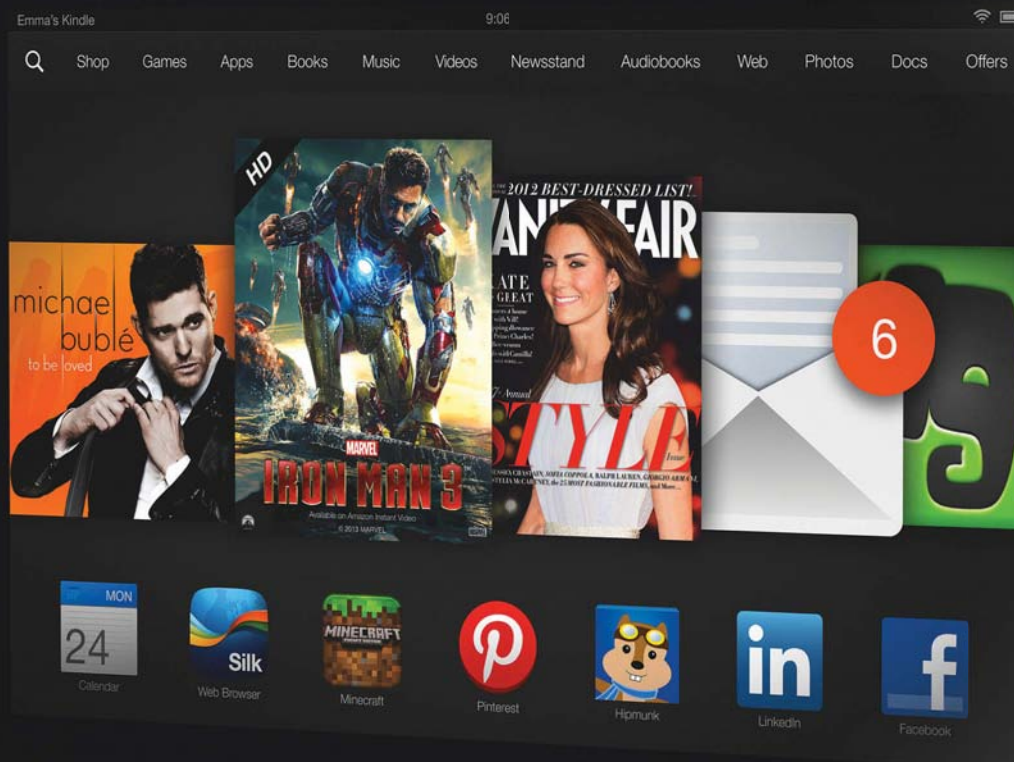
In and of itself, the Amazon Fire isn't spectacular - but we didn't expect that. We did, however, expect that it would be cheap. But at more than \$600 (£350) SIM-free, the Amazon Fire Phone is a Galaxy S5/HTC One M8/iPhone 5s-type purchase - a mid-range phone priced at the top end of the market.

If you don't believe me, take this analysis from IDC's Francisco Jeronimo: "The device brings nothing disruptive or innovative to end-users to justify such pricing. This will be a tough sell when compared to devices from the likes of Samsung, Apple or Sony."

That could be a problem. If the Fire Phone isn't cheap enough to attract casual users, it has to be awesome enough to convert iPhone or Android users. And at first blush it looks like it's, sadly, neither.

Here's what Geoff Blaber of CCS Insight has to say: "Amazon is a low-margin business

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entering an intensely competitive and cost-sensitive business in smartphones.

"To justify that investment and to drive Prime adoption, Amazon has to differentiate itself through disruption rather than by joining the status quo."

So obviously the device itself is not the point. Not the whole point, at least.

Between two poles

With the Fire Phone, Amazon is selling not just a phone, but a portable access device to all of Amazon. The ability to purchase what you see in the physical world with a single click. For that to work Amazon needs lots of manufacturers and vendors to jump on board. And to get them you need a lot of consumers to buy the Amazon Fire Phone – which makes the high-end price seem odd.

At the phone's launch, Amazon spent lots of time talking about how much its customers love its services. It repeatedly stressed that although not many people currently use Amazon Prime, those of its customers who do all absolutely love it.

It was noticeable that in a hall that held only 300 people, Amazon made sure a proportion of the audience were Amazon fans and developers. They devoted a lot of the evening to getting those invited users and developers to talk about how great

Amazon is. The whole shebang, although impressive, felt a little forced.

I think Amazon is slightly confused what its aims are with the Fire. That in turn makes me think it isn't making any money on the Kindle Fire model, and now they're trying to make sure that however many people buy Fire Phone they make a profit from each one. A profit from every customer, regardless of the margins once the hardware is in action.

Francisco Jeronimo puts it better: "The price of the Fire Phone may also suggest that the business model that Amazon tried on tablets with the Kindle Fire may not be working as expected. By making no money on hardware, Amazon was expecting to attract users to their Kindle Fire tablet and profit from selling the content. If that was a success there would be no reason for Amazon not to pursue the same business model today. In fact, it's far more likely that consumers will shop more on Amazon with a smartphone than with a tablet."

That's all well and good. Make an expensive phone, sell it for an expensive price. It doesn't need to be the most popular. As Amazon said last night – it doesn't matter if few people use a product, as long as you make a decent profit from each one.


But at the same time, Amazon seems desperate to get developers onboard,

because all of these sexy parallax and UI features will only work if developers create content for them. And the shopping function requires vendors and manufacturers. This requires Fire Phones to become mass-market products with an audience that's attractive to developers and stores. However, this seems unlikely when the Fire Phone is available from only one network, in one country.

But without support from app makers and product vendors, you have to wonder just how interested the majority of phone users will be in trading up to a new phone that's locked to Amazon for its entire life.

Flaming star or burn out?

I don't know if the Fire Phone will fail, but I think its announcement tells me that Kindle Fire is failing. Not only that, there seems to be a lack of clear vision regarding what and who the Fire Phone is for.

I'll give the final word to CCS Insight's Geoff Blaber: "Amazon has been at the forefront of disruption in the hardware business, but this announcement fails to repeat the impact of the Kindle or Kindle Fire tablet. This is contrary to the strategy of pricing hardware at cost to drive retail sales and service adoption – for the moment Amazon seems, uncharacteristically, caught between two different business models." 



See also:
AMD vs Intel
on page 101

AMD promises 50-hour battery life in laptops

A laptop that can run free from the mains for days? It's a dream come true and one that [Agam Shah](#) says AMD may soon be able to fulfil

AMD is reworking its core PC chip design to be 25 times more energy-efficient over the next six years, possibly resulting in a laptop battery life of up to 50 hours (while idling).

So said Sam Naffziger, corporate fellow at AMD, adding that estimated battery life on active use would also be significantly better in the future, although he couldn't quantify that expected improvement.

AMD is trying to sharpen performance-per-watt, with an equal emphasis on power efficiency and performance enhancements. Technological advances like reductions in chip size, restructuring of transistors, new memory technologies, solid-state drives and software improvements will also help AMD in meeting its longevity goals.

In the past six years, AMD has delivered a tenfold improvement in performance-per-watt through its chips. But the company is now taking a detailed look at circuitry, so inactive parts can be shut down in microseconds when not in use.

AMD will achieve the energy-efficient improvements on both its x86 and ARM architecture chips, Naffziger explained. The ARM processors, used in most smartphones

and tablets, are considered to be more power-efficient than the x86 chips.

AMD's performance-per-watt improvement estimates over the next six years are based on the joint performance of CPUs and GPUs, which the company integrates on a single chip. But much of the overall performance improvement recently has been driven by the GPU.

Manufacturing challenges have also made chips harder to reduce in size, so software and hardware modifications are key to bring more battery life to laptops. "Moore's Law isn't doing us any favours in power efficiency anymore," said Naffziger.

AMD is mainly counting on software improvements that make efficient use of CPUs and GPUs to reach its energy efficiency goals. The company is releasing parallel programming tools that harness the joint computing power of CPUs and GPUs. Certain GPUs could offer 10 times more performance-per-watt, Naffziger explained.

AMD's on-chip improvements include pooling memory resources that all processing units can access. The capability reduces latency and uses fewer system resources, contributing to overall energy

efficiency. An early version of the pooled memory implementation is found in Microsoft's Xbox One and Sony's PS4, as well as AMD's Kaveri chips released in 2014.

At the chip level, AMD plans to implement fine-grained power-gating features, shutting and activating processing units at lower levels of circuitry than currently possible.

Real-time performance trackers will be used so the right amount of power is always assigned to each active circuit.

"We can dynamically optimise it to the microsecond," explained Naffziger.

For graphics, AMD will take power management down to each frame rate to provide just enough power to play video at specific resolutions. Graphics can be power hungry, and the goal is to cut the overhead.

However, Naffziger still believes 'there's a lot of opportunity to improve'.

Intel has been putting more voltage regulators on chips to control power consumption. But with chips getting smaller every day, loading too many voltage regulators may be costly and add complexity to chip design, so AMD will have to evaluate the number of voltage regulators and their capabilities to hit an optimal point. ☒



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Intel shows off the most powerful processor ever made

Intel's Knights Landing, which has new memory and interconnect technology, will be in supercomputers by the middle of 2015. [Agam Shah](#) reports

Intel hopes to take hardware performance to the next level with its latest Xeon Phi supercomputing chip, which packs an array of new hardware technologies that could ultimately find their way to laptops and desktops.

The new Xeon Phi chip, also called Knights Landing, is Intel's largest and also most powerful chip package to date. It can deliver over 3 teraflops of peak performance, which is in the range of high-performance graphics chip used to crunch complex math calculations in the world's fastest computers.

The chip, which will be in supercomputers starting in the second half of next year, was detailed at the International Supercomputing Conference this week in Leipzig, Germany.

Knights Landing includes a new form of stacked memory that could ultimately displace conventional DDR memory used in PCs and servers today. Also in the chip is new 'fabric' technology called OmniScale for faster internal and external data transfers.

When combined, the new technologies offer potent performance gains that resolves scaling issues as chips get smaller. The new chip is almost three times faster than its predecessor, called Knights Corner, which has up to 61 cores and can deliver peak performance of up to 1.2 teraflops.

"We are bringing technologies to market that are powerful and can be harnessed for real use," said Rajeeb Hazra, vice president of the Data Center Group at Intel.

The first supercomputer to use Knights Landing is Cori, which incorporates around 9,300 of the chips. It will be deployed by the National Energy Research Scientific Computing Center in Berkeley, California, in 2016. The system topology will be based on Cray's interconnect, much like Titan, the world's second fastest supercomputer deployed by the US Department of Energy at the Oak Ridge National Lab in Tennessee.

Ultimately, technologies in Knights Landing could pave the way for greater performance in smaller servers, Hazra said. In a distributed computing environment, those servers will be faster in delivering cloud services, Hazra said.

At the centre of Knights Landing are processing cores based on the Silvermont architecture, which is being used in the latest

Merrifield smartphone and Bay Trail tablet chips from the company. Knights Landing will be manufactured using Intel's latest 14-nanometer process, which helps reduce the size, boost speed and improve overall power efficiency of the chip.

The number of cores on the chip were not revealed, but Hazra said it will be more than predecessors contained.

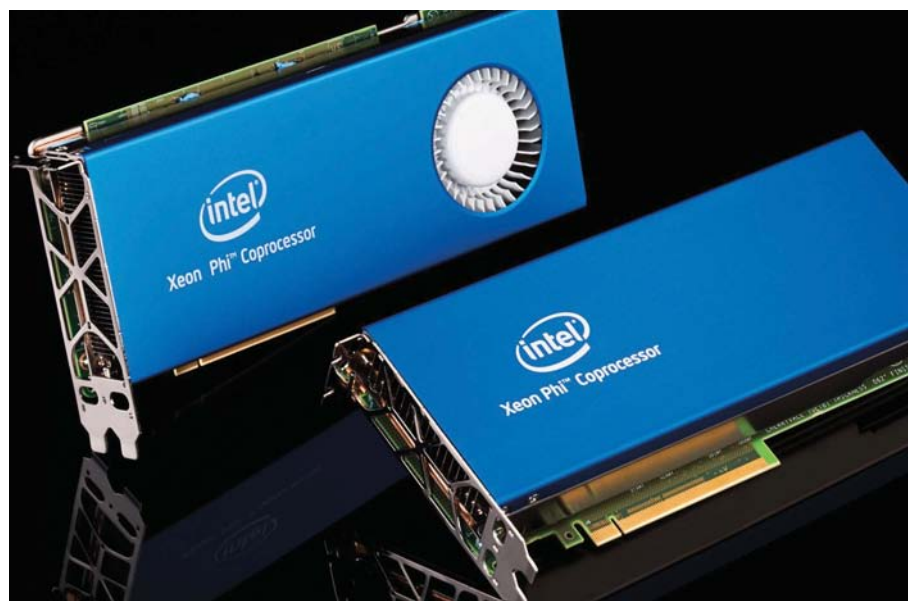
"We will provide a significant bump in performance and that will be through a number of cores and process technology," Hazra said.

Intel has integrated a new form of stacked memory based on Micron's Hybrid Memory Cube technology, which provides 15 times more bandwidth than DDR3 DRAM and five times more throughput than the emerging

The new chip also offers an interconnect called OmniScale, which is designed for high-performance computing, Hazra said. The 'fabric' will be a host interface for faster data transfers between processors, memory and other components.

Key details on the OmniScale are scarce, but it will scale better than Infiniband technology, which Intel is already working to integrate on its chips. Intel has also made a number of acquisitions to build out its networking and on-chip connectivity technology, including networking company Fulcrum Microsystems and interconnect technology from Qlogic and Cray.

Intel hopes to bring OmniScale to its Xeon server chips next year, but isn't stopping there, Hazra said. The company will also




DDR4 memory. The new memory technology consumes three times less space and five times less power than DDR4, Hazra said.

Knights Landing has 16GB of the new memory type, which should be key in speeding up supercomputing applications, Hazra said. The modules on the board have stacked memory chips linked through a wire-like connection called Through Silicon Via (TSV), which brings performance advantages.

Embedded on the chip is DDR4 memory, which can be used as cache or system memory for less-demanding applications.

bring silicon photonics technology, which will boost data transfers between servers through the use of lights and lasers. Intel has already demonstrated thin fibre-optics cables and a server connector called MXC.

Today's computers use CPUs and graphics processors to speed up complex calculations. With Knights Landing, Intel wants to bring everything on to a single chip, which could boost performance while reducing power.

"It obviates the need for a co-processor and accelerator," Hazra said. "We are putting a very powerful choice on the table." 



Apple needs to up its game fast

Dedicated Apple fan [Ashleigh Allsopp](#) likes what she sees from Apple. She'd just like to see more of it

Last month I was excited about Apple's future, thanks to June's glorious WWDC 2014 keynote. Now I'm growing increasingly impatient. Apple's biggest rivals – most notably Samsung – have been releasing new products that are so good I'm struggling to stick up for the Apple devices I use and love.

Let's take Samsung's Galaxy Tab S range (page 32). Arguably Apple's biggest rival, Samsung has never made tablets before that could match up to the iPad. With the Tab S that just changed. By the time you read this, an 8.4in iPad mini and 10.5in Air rival will be on sale. These new tablets have better displays than their Apple counterparts, they're lighter and thinner, with better cameras and more RAM, more connectivity features and additional features such as a fingerprint sensor. And Samsung is so confident about them that they've been priced to match Apple's latest iPad line-up.

There are a lot of things I don't like about the Galaxy Tab S, including the design (I'm not a fan of the plastic dimpled back) and the fact that it runs Android (I love iOS and the benefits it offers me). But Samsung has trumped Apple in every other way possible.

Samsung's not the only one. Take the LG G3. Its Quad-HD display is breath-taking, its overall design is rather nice, and many of its specs (for example memory, camera, connectivity, storage and more) are more impressive than those of the iPhone 5s.

The HTC One M8 and Sony Xperia Z2 Tablet have also caught my eye.

We're not expecting any new iPhones until September. A month later, we're likely to see an iPad event with new 10 and 7in tablets unveiled as the stars of the show.

This means for the next two to three months prospective smartphone and tablet buyers are faced with several options that offer them more for their money than they would get by staying loyal to Apple.

Apple has been the frontrunner in the smartphone and tablet markets for years,

but the competition has caught up. If Apple doesn't pick up the pace, it won't be long before it trails the brands that once aspired for its success. Apple's reputation as leader of the pack is in jeopardy. Let's hope it's not about to become a follower.

It's inevitable that Apple will launch some incredible products this year, and its WWDC 2014 software announcements left me confident that the company is heading in the right direction. But if Apple continues to wait a year between its iPad and iPhone launches I can't help but think I'll be writing the same article this time next year.

Either Apple needs to launch an iPhone and iPad that is so good it takes rivals more than 12 months to match it, or it needs to release new products even more often to keep the competition at bay. ☒

“

If Apple doesn't get a move on, pick up the pace and continue to innovate and release new products, it won't be long before it trails the brands that once aspired for its success

”



BlackBerry makes a profit as sales drop

BlackBerry managed to turn the tide toward a small profit during its fiscal first quarter, says **Mikael Ricknäs** and **Juan Carlos Perez**. But revenue and phone sales have continued to drop

Revenue for the first quarter of BlackBerry's fiscal 2015, which ended May 31, was approximately \$966m (£562m), a steep drop of about 69 percent from \$3.1bn (£1.8bn) for the same quarter in the previous financial year.

The company's \$23m (£13.4m) net profit for the period compares to a loss of \$84m (£48.9m) a year earlier too.

During the period, BlackBerry continued to see sales shrink to approximately 2.6 million BlackBerry smartphones. A year earlier, the company said it sold 6.8 million smartphones, and in the previous quarter BlackBerry sold 3.4 million units.

BlackBerry CEO John Chen said he was happy with the company's financial performance during the quarter.

"We continue to make solid progress in our plan to return BlackBerry to growth and profitability," he said during a conference call to discuss the results.

Chen reiterated his forecast that the company will return to annual profitability in its 2016 fiscal year, and said BlackBerry has a solid pipeline and roadmap of new and improved products on the way.

In particular, Chen highlighted the Z3 smartphone, which is already available in Indonesia and will be launched in eight other countries, as well as the launch of Project

Ion, focused on the developing lucrative Internet of Things market.

Chen also singled out that EZ Pass Program, which since its March launch has resulted in the issuing of 1.2 million licences for BlackBerry Enterprise Server 10.

Most of these licences have been BES 5 trade-ins, but 10 percent have been from competing mobile device management products, he explained.

After focusing on cost cutting and margin improvement, Chen said, his attention is now on revving up revenue growth.

Chen also said that in the eyes of its enterprise customers, BlackBerry comes across as a viable vendor again, and that CIOs are now more comfortable investing in the company's products, which they've historically considered reliable and secure.

Wall Street gave BlackBerry a big endorsement after the earnings report, as excited investors sent the company's stock up more than 13 percent in morning trading.

On a pro-forma basis, excluding tax-related and other accounting changes, BlackBerry had a quarterly net loss of \$60m (£34.9m) or \$0.11 (6.4p) per share.

The consensus forecast from financial analysts polled by Thomson Financial was for a pro-forma loss of \$0.26 (15p) per share and revenue of \$963.2m (£561m),

so the company topped Wall Street's latest expectations for both metrics.

BlackBerry had \$3.1bn (£1.8bn) in cash, cash equivalents, and short- and long-term investments at the end of quarter, compared to \$2.7bn (£1.57bn) at the end of the previous three-month period.

The results were announced a day after BlackBerry announced it had signed a deal with Amazon to integrate the retailer's store for Android apps with BlackBerry 10.3 OS, which will be released later this year.

The change lets consumers access a larger number of apps and leaves BlackBerry to focus on expanding its number of enterprise apps. CEO John Chen's plan to save the company relies more on software than hardware, with enterprise messaging and mobile management tools for its own OSes, Android and iOS.

For example, earlier this week BBM Protected, which lets users send encrypted instant messages, became available. It's the first application in BlackBerry's eBBM Suite, which will offer various kinds of secure messaging for enterprises. The software works with BlackBerry phones running BBOS 6.0 or later or BlackBerry 10 in regulated work space mode only. Versions compatible with BlackBerry 10 Balance and iOS and Android devices, are expected soon. [\[X\]](#)

Popcorn Time is the Netflix of illegal downloading



What we watch and how we watch it is based on quality, satisfaction and convenience – which is why a new Napster is the next big thing for watching films and TV shows. **Neil Bennett** explains

A few weeks ago, a friend and I were discussing why we're still watching *Lost Girl*, despite the Canadian *Buffy*-with-lots-of-sex TV show featuring a cast including a few actors who couldn't act their way out of a local amateur dramatics production, plot lines simpler than an average episode of *Rastamouse* and an on/off relationship with things like plot cohesion and character development. In short, it's dumb as a sack of hammers.

My friend pointed out that for her, one of its key strengths is the normalised way it presents sex and sexuality, including LGBT and poly lifestyles and relationships. The show's fae society is a post-homophobic fantasy world where difference is both accepted and celebrated – and that's worth putting up with the main male actor's wince-inducing attempts at conveying emotion, which usually end up him looking off-screen as if expecting to be told "Well done love!" by the director and given a dog biscuit.

Most of the time, we're happy to tolerate imperfect things if we can't find better ones that give us something we're specifically looking for. Brilliant TV shows with great acting, directing and art direction that tie in with particular genres or beliefs are rare – look at many people's obsession with *Game of Thrones*, arguably the first brilliant TV

show in a genre where people used to watch *Xena: Warrior Princess* because that was the only fantasy worlds represented on TV.

So what has this got to do with Popcorn Time and Netflix and people downloading shows illegally? Well, a lot. The amount of illegal downloading that goes on in the world is affected by two factors: how easy it is to get hold of what we want legitimately, and how easy it is to steal it. If we can get what we want easily (and relatively cheaply) from legal services, and it's harder and less satisfying to steal, we'll stick with the legit.

If there was a *Thrones*-quality show that was like *Lost Girl*, but I'd have to wait hours to download it, then plug my laptop into the TV, I'm almost certainly going to use the Netflix app on my phone to put *Lost Girl* on my TV through my Chromecast. It's because for a long time, legit has been much easier than the dodgy world of torrents – but Popcorn Time changes that back again.

When Napster became huge in 1999, it wasn't because Shawn Fanning had invented file sharing, but because it made music downloads easy for the non-techminded.


Since Napster got stomped on by US record companies, systems like BitTorrent have normalised file sharing for some – and made it more about films and TV shows – but it's since disappeared underground.

Conversely, legal services have become far easier and more satisfying to use. Netflix and BBC iPlayer both made it easy for you to watch shows and films on your laptop, iPad or phone, while cheap and simple devices such as Google's Chromecast or the inclusion of smart services within TVs, consoles and set-top boxes make it even simpler.

Where the legal services fall down is that they don't have all the content you want.

Popcorn Time has *everything*. Well, everything popular anyway. The interface of the Windows and Mac apps are as easy to use as Netflix too. With most torrent apps, you have to wait until a whole torrent is downloaded before watching. With Popcorn Time, it starts at the beginning, so you can watch a show or film as if it was being streamed. It's also relatively easy to push the content to your TV via Chromecast, too.

I can easily see Popcorn Time becoming huge and that makes it a big target for content creators who naturally would rather you pay for their shows and movies than steal them off the Internet.

Popcorn Time's creators say that taking it down (as the US-based RIAA did with Napster) would be impossible as there are many different versions of the open source application – and if courts remove one, then another can be created in minutes. 



LG Curved 4K OLED TV

Television

LG likes to produce world firsts and its latest is a TV that combines a curved panel, OLED technology and an Ultra HD (4K) resolution. Available in 65- and 77in, both sizes will be available in the UK in October running the webOS platform. Features include upscaling from SD content and higher, LG's HDR algorithm and 3D.

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Google Glass is one of the most futuristic gadgets around, providing information at your eye-line through a clever heads-up display (HUD). In time for the UK Explorer Programme launch, Glass has been upgraded with double the RAM at 2GB. It has a built-in camera and can be ordered with frames or sunglasses attached.

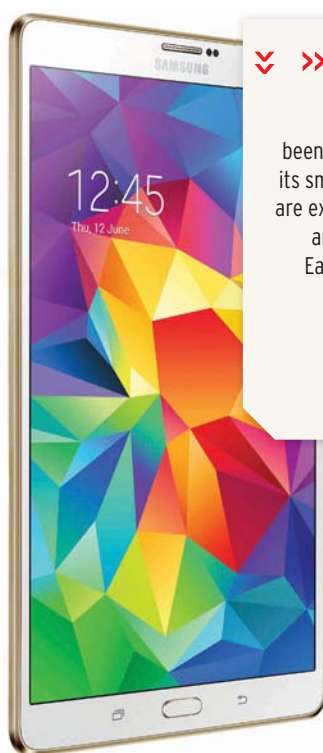
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Precious little hardware was announced at E3 2014, but Sony did introduce the PlayStation

TV. It will allow PS4 owners to play on a second screen, and to stream older games (including those for the original PlayStation) via the PlayStation Now service unassisted.

They'll also be able to watch films and TV shows, and listen to music.

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Samsung Galaxy Tab S

Tablet

Samsung's tablet range has finally been given the 'S' branding we've seen on its smartphones. The Galaxy Tab S devices are extremely thin and light at just 6.6mm, and take design elements from the S5. Each has a high-resolution (2560x1600) screen and includes a fingerprint scanner and IR blaster.

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DAB Radio

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>> Withings Activité

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Wearable devices continue to boom and things are getting more stylish. The Withings Activité will arrive this autumn and doesn't even look like a gadget. It's a swiss-made analogue watch with hidden activity-tracking abilities. It can track your daily movements and sleep via an app.

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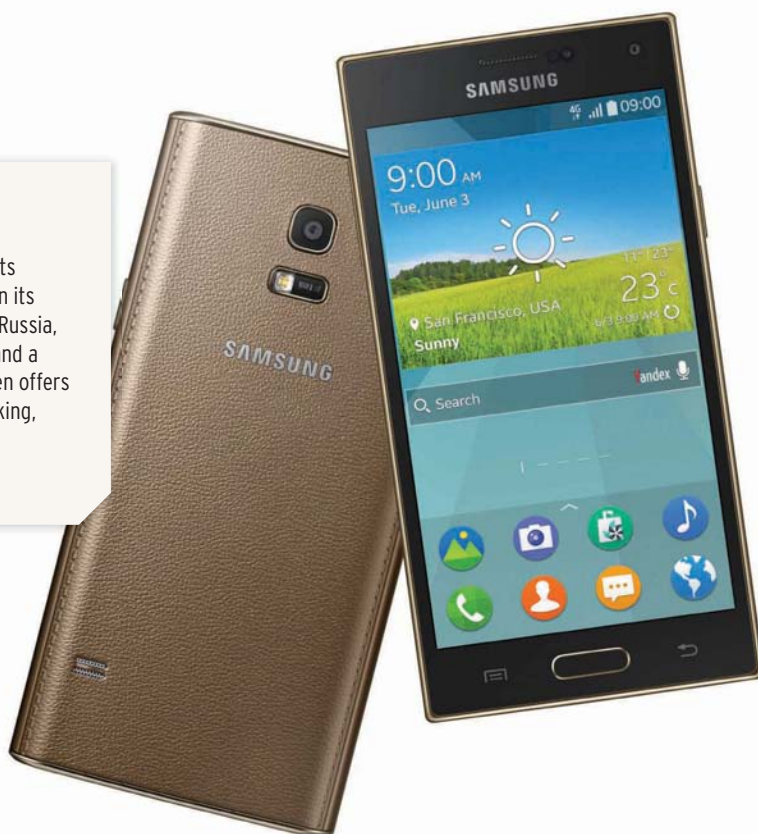
Samsung Z >>

Smartphone

The Z is Samsung's first smartphone to run on its own Tizen operating system, which you'll find on its latest Gear smartwatches. It will launch first in Russia, featuring a 4.8in (720p) Super AMOLED screen and a 2.3GHz quad-core processor. Samsung says Tizen offers optimal performance for startup time, multitasking, scrolling and web browsing.

Price TBC

samsung.com/uk




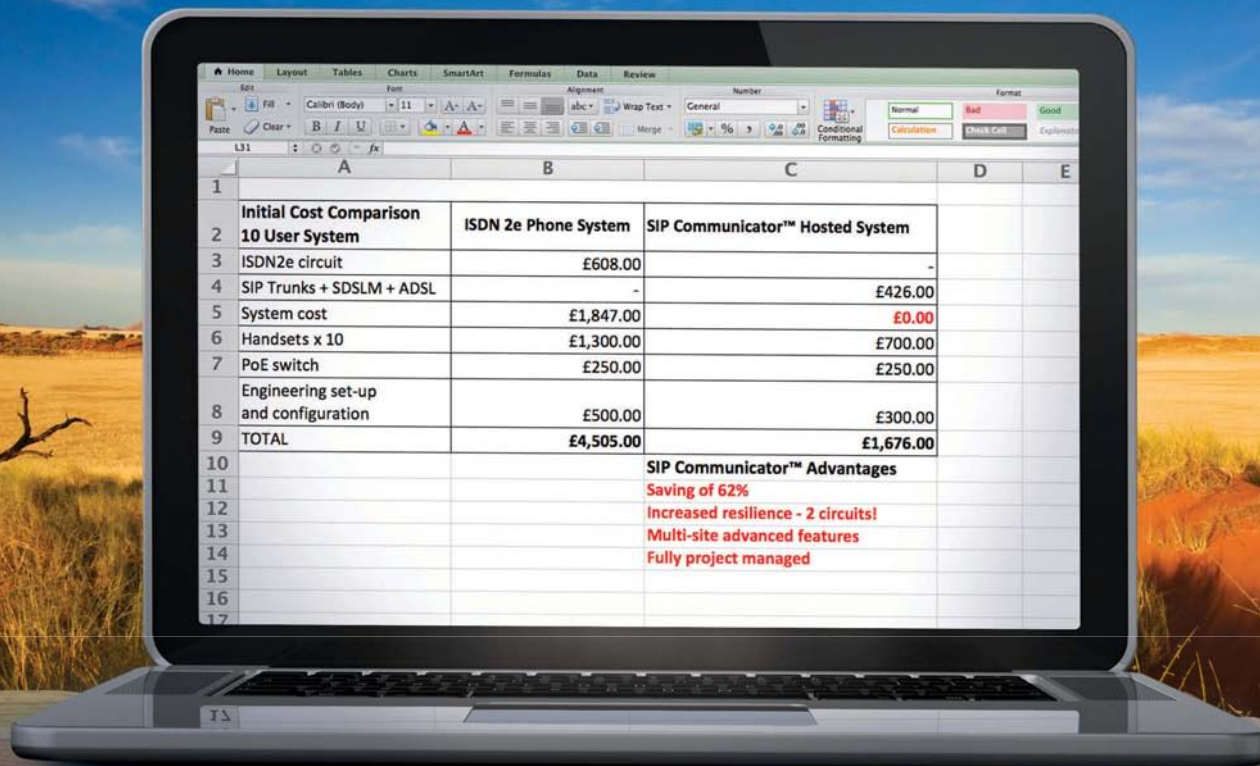
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17.3in (1920x1080, 127ppi) TFT display, glossy, touch-sensitive; 1.8GHz Intel Core i7-4500U (3GHz Turbo); Intel HD Graphics 4400/nVidia GeForce GT 750M (2GB); Windows 8.1 (64-bit); 16GB DDR3L RAM; 500GB hard drive (5400rpm) + 8GB solid-state cache; 802.11b/g/n/a; Bluetooth 4.0; 1x HDMI 1.4a; 4x USB 3.0; SDXC/MMC card slot; 720p webcam/microphone; 1x headphone/microphone socket; 58Wh lithium-ion battery; 412x269x28mm; 3.3kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



LAPTOP

Dell Inspiron 17 7000 Series

Dell has updated many of its laptops recently, and it seems that anything with the '7000' suffix now has a slimmer design and a smart new aluminium casing. The Inspiron 17 is the latest model to join the 7000 club, and while it's not an Ultrabook it does provide a very smart and versatile desktop replacement laptop at a competitive price.

It's certainly one of the more attractive 17in laptops currently available, measuring a relatively svelte 27.7mm thick compared to the 35.6mm of last year's model (which is still available for a very attractive £699). The brushed metal aluminium casing looks very attractive and is also very sturdy. The spacious keyboard is firm and comfortable, and it's nice to have a decent-sized 105x80mm trackpad.

Skinny but weighty

Although this new model is much slimmer, the Inspiron 17 7000 Series still includes a built-in DVD drive along with four USB 3.0 ports, gigabit Ethernet and HDMI interfaces. The only disappointment here is that it still weighs the same as its predecessor (3.3kg). So while it's slimmer and more stylish than most 17in laptops, the Inspiron 17 7000 Series still isn't very portable and will spend most of its time at home or in an office.

If you need to travel with your laptop, then switching to the integrated HD4400 graphics will allow the Inspiron to provide a full five hours (300 minutes) of streaming video, which is a good performance for a 17in laptop.



The 17 is well suited for use both at home and at work too. The 17.3in display provides 1920x1080 resolution, and a bright image with very good all-round viewing angles. It will work well for watching streaming video at home or giving a PowerPoint presentation at work. It's also one of the few 17in laptops we've seen with a touch-sensitive screen, and the touch-controls work quite well on a larger screen such as this, making it easy to control a slide presentation or to tap on a link in your web browser.

The speakers sound a bit tinny, but they're loud enough to listen to some music or give an impromptu presentation without needing to plug in a set of external ones.

The Inspiron 17 7000 Series also provides desktop levels of performance for both productivity apps and entertainment. Prices start at £749 for a model with an i5 processor, 8GB memory and 500GB hard drive. However, we tested a top-of-the-range model priced at £849 with a dual-core i7 running at 1.8GHz (3GHz with TurboBoost), a full 16GB of memory and 1TB hybrid drive that includes 8GB solid-state cache to boost performance. And, in addition to the i7's integrated HD 4400 graphics, the Inspiron also includes a discrete GeForce GT 750M graphics card with 2GB of memory.

Hybrid storage

The hybrid hard drive isn't entirely successful, as the Inspiron takes 45 seconds to boot even when using the fast-start option in Windows 8.1. Fortunately the laptop does feel fast and responsive once it's up and running. It wakes from sleep as soon as you lift the screen, and the touch-controls respond smoothly.

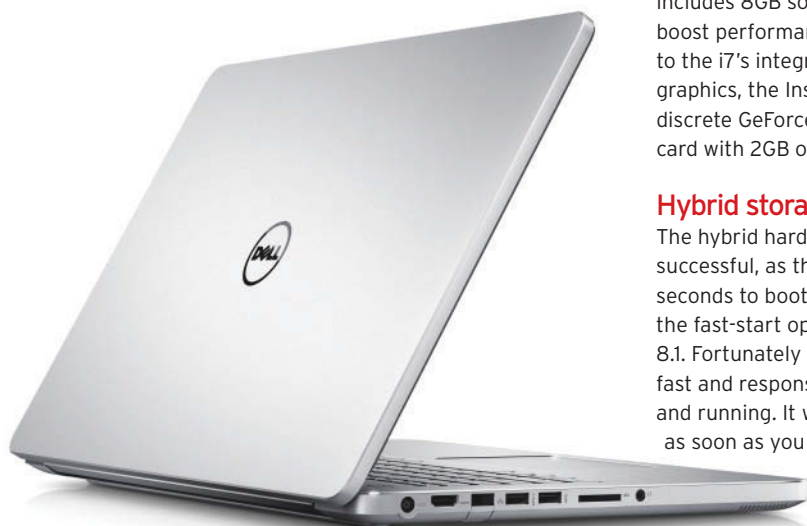
The Inspiron 17 7000 Series produced a score of 4260 points when running the general purpose PCMark 7 benchmark – which is about as good as you'll get from a laptop that doesn't have a dedicated solid-state drive. Scores in the Home and Work suites of PCMark 8 were a little more modest, at 2450 and 2900 respectively, but the Inspiron provides strong performance for a wide range of tasks, and its 16GB of memory mean that it will also be able to tackle heavy-duty work such as editing HD video.

While it's not a dedicated gaming laptop, the Inspiron's GeForce GT 750M graphics card is perfectly adequate for the casual gamer. It managed 104fps when running Stalker: Call Of Pripyat at 1280x720 resolution, and held steady at 63fps when we increased that to 1920x1080. The more demanding Batman: Arkham City provided a sterner test, dipping to just 20fps when running at 1920x1080 with DX11 and high graphics settings.

However, dropping to medium graphics settings and a resolution of 1600x900 allowed the Inspiron to hit a more playable 37fps, which isn't at all bad for a laptop falling into this price range.

Verdict

It's a shame that Dell couldn't shave a little more weight off the new Inspiron 17 7000 Series, as it would have been great to see a 17in laptop that you could carry around in a backpack or briefcase. However, it does provide a high-quality touch-sensitive screen and strong all-round performance at a competitive price, and it will make a fantastic choice for anyone who needs a powerful, large-screen laptop for use at home or at work. **Cliff Joseph**



£1,199 inc VAT**Contact**■ hp.com/uk

Read more

■ tinyurl.com/kywoh9b

17.3in (1920x1080, 127ppi)
TFT display, glossy,
touch-sensitive; 2.2GHz
Intel Core i7-4702MQ
(3.2GHz Turbo); Intel HD
Graphics 4600
(integrated)/nVidia
GeForce GT 750M (4GB);
Windows 8.1 (64-bit);
12GB DDR3L RAM; 1TB
hard drive (5400rpm);
802.11b/g/n; Bluetooth 4.0;
1x HDMI 1.4; 4x USB 3.0;
SDXC card slot; DVD
SuperMulti Drive; 720p
webcam/microphone;
1x headphone/
microphone socket;
62Wh lithium-ion battery;
416x276x33.4mm; 3.4kg

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

**LAPTOP****HP Envy 17 Leap Motion SE**

We saw the standalone version of the Leap Motion Controller earlier this year and were impressed by its promising gesture-recognition technology (leapmotion.com). Now here's a laptop that integrates Leap Motion.

The motion sensor in the Leap Motion Controller works in a similar fashion to Microsoft's Kinect, allowing you to use hand gestures to control a Windows PC or Mac. Now that touch-sensitive screens have become commonplace on phones, tablets and laptops, HP is clearly hoping to be the first manufacturer to incorporate the Leap Motion technology in a laptop.

Fairly conventional

For the most part, the Envy 17 is a fairly conventional 17in laptop. This 'special edition' model is priced at £1,199 with a Haswell-generation Intel Core i7 processor running at 2.2GHz, a giant 12GB memory and 1TB hard drive. There's even room for a built-in DVD drive.

As well as Intel's HD 4600 integrated graphics the Envy 17 also includes an nVidia GeForce GT 750M graphics processor that provides modest gaming capabilities.

If you're after a more affordable large-screen laptop, then the standard Envy 17 is available without the Leap Motion sensor, and a better value Core i5 processor, for £799.

A 17in laptop isn't meant to be slung in a rucksack, but its 3.4 kg weight isn't unliftable and it can easily be carried from room to room at home or at work.

Battery life is rather below par though, giving us just 3 hours 45 minutes of streaming video, that using the more economical integrated graphics. We've seen 17in laptops with better battery life, including 5 hours from Dell's new Inspiron 17-7000 model, but the



Envy 17 isn't going to stray far from a mains socket so that's probably not a deal-breaker for many people.

Performance is a mixed bag. The general-purpose PCMark 7 places emphasis on storage performance, and its 5400rpm hard drive meant that the Envy 17 managed a score of just 3300 points.

That's not a bad score, but a faster solid-state drive would push this well past the 4000-point mark.

The more specialised Home and Work suites in PCMark 8 produce similar results, with scores of 2867 and 3000 points respectively that are respectable, but not outstanding.

Even using the Microsoft Windows 8 'fast-start' option (actually a standby mode), the Envy 17 took a full 30 seconds to boot into the Start screen, followed by another good 15 seconds of cursor-spinning before it was ready to start launching apps and get to work.

Once it got going, the Envy 17 was capable of tackling a wide range of tasks, and its large screen, memory and hard drive mean that it's ideal for demanding work such as photo- or video-editing.

The 1920x1080 display is bright and colourful, with horizontal viewing angles that come close to a full 180 degrees. The vertical viewing angle is a little more limited - around 140 degrees - but the

Envy 17 will still work fine for presentations or simply watching streaming video at home.

And while the Envy 17 isn't intended as a gaming rig, its GeForce GT 750M graphics could manage a respectable 52fps when running our

Stalker gaming test at 1920x1080 resolution. This laptop will be fine for regular gaming sessions.

Leaps and bounds

Of course, the real attraction is the new Leap Motion sensor - which includes a fingerprint reader. It's a slim plastic strip that's 120mm in length, and sits just below the right-hand edge of the keyboard. The technology is impressive, and the sensor is precise enough to detect even small movements of all ten of our fingers on both hands.

But, as we found when testing the Leap Motion Controller earlier this year, only a few apps use gesture-recognition function well.

Leap Motion's AirSpace Store does include some fun games and musical apps, as well as some apps that can use gestures to control Windows itself. You can use gestures to browse through your holiday snaps, but that may not justify the £1,200 price tag.

Some of the most interesting third-party apps use gesture control for 3D modelling and visualization, so there might be a specialist market in some design and scientific fields, but we're still some way from Tom Cruise flicking holographic screens around in *Minority Report*.

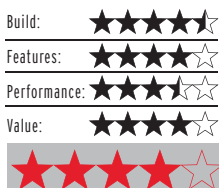
Verdict

Full marks to HP for attempting something different. However, gesture-recognition is still in its infancy and only a few apps use it in an imaginative way. The Envy 17 Leap Motion SE might appeal to a few niche markets, but at well over £1,000 it will probably seem like an expensive luxury for ordinary home and business users. **Cliff Joseph**



£999 inc VAT**Contact**■ hp.com/uk**Read more**■ tinyurl.com/n4cjqL9

13.3in (1920x1080, 166ppi) LCD display, glossy, touch-sensitive; 1.66GHz Intel Core i5-4200U (2.6GHz Turbo); Intel HD Graphics 4400; Windows 8.1 (64-bit); 8GB DDR3L SDRAM; 256GB solid-state drive; 802.11a/b/g/n/ac; Bluetooth 4.0; 1x HDMI 1.4; 1x Mini DisplayPort 1.2; 2x USB 3.0; SDXC card slot; 1080p webcam/microphone; 1x headphone/microphone socket; 51Wh lithium-ion battery; 324x220x15mm; 1.52kg

**LAPTOP****HP Spectre 13-3010ea**

Someone at HP has obviously had their thinking cap on. The company recently released its Envy 17 laptop with a built-in Leap Motion sensor (see previous page) that allows you to control the laptop with hand gestures. The Spectre 13 boasts a less exotic innovation in the form of a Very Big Trackpad.

That's not HP's name for it, but given the US company's Love of Capitals and trademark signs it might as well be. We realise a larger trackpad might not sound exciting, but small details can make a big difference, and the Spectre 13 turns out to be one of the most attractive Ultrabooks we've seen recently.

In most respects, the Spectre 13 looks very similar to its numerous predecessors in the Spectre range, based on the Apple MacBook Air design, with a slimline aluminium chassis that is both sturdy and elegant. It's eminently portable too, with a weight of just 1.52kg, and a smoothly tapered profile that measures just 15mm thick.

Excellent display

Its 13.3in display is excellent, with a bright, colourful image that's so crisp and sharp that we initially wrongly assumed it must have a pixel-packed Retina display similar that of Apple's MacBook Pro.

In fact, it turns out to be a 1920x1080 resolution – which makes more sense given the Spectre's £999 price tag – but it's certainly one of the best displays we've seen on a laptop costing less than £1,000. HP only refers to it as a 'Radiance' display, but the brightness and all-



round viewing angles are what we'd expect from an IPS panel.

And, just to show off that excellent display, HP even bundles a free copy of Adobe Lightroom so that you can edit and show off your holiday snaps in all their glory.

The screen is touch-sensitive, but that seems almost irrelevant once you get used to that extra large trackpad. Measuring 140x67mm, it's the largest trackpad we've ever seen on a laptop. The surface of the trackpad has a very smooth finish that feels pleasantly tactile, and it responds very smoothly to the various multiple-finger gestures that are available.

There's a special control panel for the trackpad that allows you to divide it into three sections, with narrow 'control zones' on the far right and left edges that can be used to mimic touch-screen controls such as a left-flick to activate the Windows 8 'charms'. I prefer the trackpad on my MacBook Air to that of most Windows laptops, but HP's twist on the trackpad theme could teach even Apple a few tricks.

Only one model

The Spectre 13 is currently only available in a single configuration, priced at £999 with a dual-core Intel Core i5 running at 1.66GHz, 8GB of memory with a 256GB solid-state drive. The Spectre 13 outgunned the similarly-priced MacBook Air when it came to PCMark 7 performance.

That combination achieved a respectable mid-range score of 5006 points when running PCMark 7, compared to around 4200 points for the recently updated 13in MacBook Air.

The Home and Work suites on PCMark 8 didn't fare quite so well, though, with scores of 2260 and 2651 points, respectively.

Gaming performance is poorer too, as the integrated HD Graphics 4400 couldn't sustain decent framerates until we dropped resolution right down to 1280x720 pixels, where it then averaged a more a playable 31fps in our Stalker: Call of Prip'yat casual gaming test.

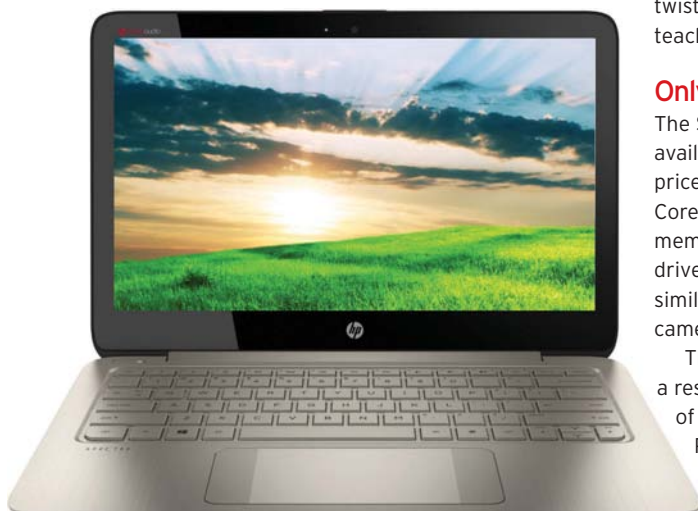
But, to be fair, there's always a trade-off between performance and portability with Windows Ultrabooks such as this, and the Spectre 13 was still adequate for routine tasks such as web browsing and running Microsoft Office. Unfortunately, the other trade-off is reduced connectivity, with one pair of USB 3.0 ports and lack of ethernet.

However, the Spectre 13 compensated with usable battery life, giving us 7.5 hours (450 minutes) of streaming video via BBC iPlayer, even if the 13in MacBook Air can manage over 12 hours.

Verdict

It won't break any speed records, but the HP Spectre 13 is a smart, attractive Ultrabook that can give Apple's MacBook Air a run for its money. The HP's slimline design, high-quality display and reasonable battery life help ensure that it earns its keep when you're out and about.

Of course, there's that gorgeous over-sized trackpad, which is a worthy innovation that makes it slightly more comfortable to use than many of its rivals. Will we see more oversized trackpads emerging? Only time, and the success of the Spectre 13, will tell. **Cliff Joseph**



£519 inc VAT**Contact**■ toshiba.co.uk**Read more**■ tinyurl.com/L76jxuv

15.6in (1366x768, 101ppi) glossy TN display; 1.6GHz Intel Core i5-4200U (2.6GHz Turbo); Intel HD Graphics 4400; Windows 8.1 (64-bit); 8GB DDR3L RAM; 1TB hard drive (5400rpm); 802.11b/g/n; Bluetooth 4.0; gigabit ethernet 1x HDMI 1.4, 1x VGA; 2x USB 3.0, 1x USB 2.0; SDXC card slot; 720p webcam/microphone; 1x headphone; 52Wh lithium-ion battery

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

**LAPTOP****Toshiba Satellite L50-B-1DV**

When we first reviewed one of Toshiba's L50 laptops last year, we suggested the company should "cut the price by £100 and it'd be a good budget offering". The price cut on this year's model is closer to £130, which means that it now ought to make a very decent budget laptop.

This year's model is slimmer and lighter, as it no longer includes an internal DVD drive. The 15in display chassis has slimmed down from 29- to 23.5mm thick, while the weight has dropped 300g to 2.2kg.

Slim and light

It's one of the slimmest and lightest 15in laptops we've seen recently, and far more portable than most budget Windows laptops.

Its build quality is unexceptional, as the casing - which is available in a variety of colours - has a distinctly plasticky feel to it. It seems reasonably sturdy and we wouldn't worry about it taking the occasional bump in a backpack.

There's flex in the keyboard panel, but the keys themselves feel firm and responsive and we felt comfortable enough typing up some notes on the Toshiba L50 during our test period. We were also happy to see a gigabit ethernet port on the left-hand edge for wired networks.

But while the external design has been updated the main components inside the L50 haven't changed much since last year.

Prices for the Toshiba L50 range start as low as £319 for the model with an old Intel Pentium processor, or £399 with a newer Haswell-generation Intel Core i3. We tested one of the mid-range models that costs £519 with a Core i5 running at 1.6GHz with a healthy 8GB of memory and 1TB hard drive.

There's also an Intel Core i7 version for £619, while £649 will get you an AMD Radeon R7 M260 graphics card thrown in as well.

The specification of our review unit was essentially unchanged from last year, and the 15.6in screen has the same 1366x768



resolution. That's more forgivable at this new lower price, and while the viewing angles are still limited - around 120 degrees vertically and horizontally - the image is bright and colourful enough for web browsing and streaming video.

The speakers are described as 'Skullcandy certified'. We found them quite loud and with a reasonably solid bass sound, although higher frequencies still have a tinny timbre to them.

Slower than before

Given the similarity in the basic specification we were a little surprised to find that the measured lab performance of this model wasn't quite as impressive as that of its predecessor.

The updated L50 managed only 2500 points in the general-purpose PCMark 7 benchmarks, compared to 2850 points for the model we tested last year - and that's despite both having the exact same CPU, memory quota and hard disk capacity.

The Home and Work suites in PCMark 8 were equally modest at 2150 and 2370 points respectively. We suspect the hard drive is the culprit here, acting as a severe bottleneck in our benchmark tests.

You certainly notice the sluggish hard drive when turning the laptop on. Even when using the Windows 8 fast-start option the L50 takes a good 35 seconds to boot into the Start screen, followed by about 15 seconds of cursor-spinning before it's ready to launch applications and get down to work.

Even so, those performance scores are still above average for a laptop in this price range, and once it's caught its breath the L50 is perfectly capable of handling web browsing and routine tasks like running Microsoft Office.

The 8GB of memory is also good for a budget laptop, and means that the L50 can handle the occasional intensive session of photo- or video-editing when required.

Gaming is probably out, though, as even at 1280x720 resolution the Toshiba L50 could only manage 23fps in our casual gaming test with Stalker: Call Of Pripyat.

Battery life was also disappointing. Last year's touchscreen model gave us just over 5 hours of streaming video from BBC iPlayer, but this new model surprised us by shutting itself down after just four hours, 15 minutes. And that's with a battery that's swelled from 42 to 52Wh capacity, and no battery-draining touchscreen. What's going on?

Verdict

It certainly has its flaws, but a healthy price cut means that the L50 looks better value for money. It's not particularly fast, but it can handle basic computing work perfectly well, and the slimmer, lighter design of this new model means that the Toshiba L50 is a bit more portable than most of its low-cost rivals. Its larger battery doesn't help its runtime, and in benchmark tests it's slower than last year's model - despite having largely the same components. **Cliff Joseph**



£1,249 inc VAT**Contact**■ chillblast.com**Read more**■ tinyurl.com/megk9o9

3.4GHz Intel Core i5-4670K, overclocked to 4.2GHz; Corsair H60 CPU cooler; 16GB Corsair DDR3 1600MHz RAM; 120GB Samsung 840 EVO SSD, 2TB Seagate Barracuda hard disk (7200rpm); Corsair RM750 750W PSU; Asus Maximus VII Ranger motherboard; Windows 8.1 (64-bit); PowerColor AMD Radeon R9 290 OC (4GB), 1030MHz/5GHz memory clock; onboard sound; gigabit ethernet; 6x USB 3.0, 2x USB 2.0; 2x DVI; 1x HDMI; 1x DisplayPort; 6x audio output; Corsair Graphite 230T case; 24x DVD ± RW drive; 2-year C&R warranty

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**DESKTOP PC****Chillblast Fusion Ranger**

With its propensity for mixing high-value components with well-judged firepower, PC builder Chillblast has garnered many an award over the past few years. The Fusion Ranger is another tidy package that trawls the market for the meanest components available. Perhaps the headline act is the Maximus VII Ranger motherboard, an assured member of Asus' premium Republic of Gamers range, and a proud recipient of Intel's brand-new Z97 chipset.

Slotting into place on the mainboard is an Intel Core i5-4670K processor. Generally timed at 3.4GHz, this has been pushed up to 4.2GHz here. It's perhaps not as high-end as those labelled Core i7, and only processes four rather than eight threads. But the PCMark 7 score of 6852 points shows this to be fast PC.

Chillblast has teamed the CPU with some strong sub-components. The 16GB of Corsair 1600MHz memory is to be expected for a gaming system, while the storage options comprise the familiar 2TB Seagate Barracuda, and a lightning-fast 120GB Samsung 840 EVO SSD. A 24x Samsung DVD ± RW tops off the battery of drives.

The graphics card is almost as eye-popping as it gets, with a PowerColor rendition of the AMD Radeon R9 290 OC driving this PC on to some emphatic game framerates. It shattered the 300fps mark in Sniper Elite V2, scoring an average of 321fps at the lowest 1280x720 settings, and 164fps at Medium quality. Even in Ultra quality and 1920x1080 resolution, it still managed to return 42fps.

The results from Alien vs Predator were more emphatic, with the 173.2fps at 1280x720 a top-grade score. Even at 1920x1080, it achieved a formidable 97fps. There are faster gaming PCs, but the Fusion Ranger is still a showstopper.

The Corsair Graphite 230T is far from the most attractive case we've seen, and the crimson glow emanating from within does lend it a demonic air. The panels slide forwards rather than backwards, and getting underneath the lid isn't quite as simple as it might be.

Once you're in, though, it's an impressive product. It's always going to be hard to leave room in the case

when there are so many substantial components jockeying for position.

The cables from the Corsair H60 CPU cooler were a touch unruly, but realistically, there's little that can be done about that without compromising on the cooling. There's plenty of room around the memory chips, and only two of the slots are taken up. Indeed, all of the components – even the sizeable graphics card – are situated in plenty of space. And because the front panel of the case is a grid rather


than a solid slab, air is allowed to move in and out with freedom. In short, the 230T works brilliantly as a means of keeping these heavyweight components cool.

The 750W Corsair PSU is another tidy inclusion, and keeps the PC well supplied with power, and it needs plenty of this. We measured 67W while the PC is sat idle, and when subjected to benchmark tests it gobbled as much as 386W.

It isn't supplied with a keyboard or mouse are supplied, although Chillblast has some great gaming peripherals available should you want to add something suitably suitable. A top-flight flat-panel would also be a good addition since no screen is supplied either.

Chillblast's usual two-year collect-and-return warranty is included. The company continues to go from strength to strength, so its continued existence must be one of the safer bets amongst PC builders.

Verdict

This isn't perhaps Chillblast's most spine-tingling PC. Nor is it cheap. But then, you are getting a monstrous graphics card, a new chipset, and a host of impressive components for the money. For those searching for good performance combined with ample cooling, this is another enticing proposition from Chillblast.  **Robin Morris**



£780 inc VAT**Contact**■ dinopc.com

Read more

■ tinyurl.com/pfa55f7

3.5GHz Intel Core i5-4690 (3.9GHz Turbo); 24in Iiyama E2483HS flat-panel; Intel E97378-001 CPU cooler; 8GB Crucial DDR3 1600MHz; 1TB Seagate ST1000DM003 hard disk (7200rpm); 128GB Corsair Force Series GS SSD; CIT 500W PSU; Gigabyte H97M-D3H motherboard; Windows 8.1 (64-bit); Zotac nVidia GeForce GTX 750 Ti (2GB) 1033MHz (1111MHz Boost)/5400MHz memory clock; onboard sound; gigabit ethernet; 802.11n Wi-Fi; 5x USB 3.0, 3x USB 2.0; 2x HDMI (inc 1x e-Mini HDMI); 2x DVI; 1x D-Sub; 6x audio; Fractal Design Core 1000 USB3 case; Gigabyte KM6150; 3-year warranty

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**DESKTOP PC****Dino PC Raging Lizard V2**

Some of the PCs we cover are huge fire-breathing dragons, obliterating the toughest benchmarks and graphics test without so much as a twitch of a muscle. The Dino PC, though, is no such gargantuan beast. Rather, it's a modest-sized and enticingly-priced little number that does almost everything fairly well, but without ever threatening to take your breath away.

The presence of the Intel Core i5-4690 is perhaps the PC's biggest distinguishing point between the Raging Lizard V2 and its sibling, the Microraptor (tinyurl.com/mxmj6qt). This new CPU runs at 3.5GHz as standard, compared to the 3.4GHz speed of the i5-4670K.

With turbos at full boost, the Core i5-4690 can get as high as 3.9GHz - the i5-4670K was similarly 0.1GHz behind here. The new chip won't perhaps be as well suited to overclocking specialists, but its general speed is very good. Indeed, it helped this system along to a figure of 6431 points in PCMark 7 testing. That's a decent score given that the memory consists of 8GB of 1600MHz Crucial chips, and the Dino more than holds its own against the majority of the 16GB systems.

Perhaps the real beauty of this system is that it never goes for excess. That CPU, for instance, doesn't need fancy cooling, and the standard Intel E97378-001 fan is (quite rightly) deemed capable of keeping the temperature down.

Nor does Dino PC feel the need to pack out the machine with a sizeable power supply, and the 500W CIT PSU is more than sufficient for the purposes. The Raging Lizard can still deliver where necessary, though. A 128GB Corsair Force Series GS is an assured SSD unit, while the 1TB Seagate Barracuda ensures that the PC has a decent reserve of storage on hand.

The graphics card consists of a Zotac GeForce GTX 750 Ti with 2GB of video memory, and this established performer turned up some comfortable framerates in testing. The 102fps result at 720p in Aliens vs Predator is just 1fps behind the figure from the recently tested Gladiator Firestorm OC (tinyurl.com/pkdv2ng), despite the



latter system being overclocked to a mighty 4.2GHz. The Dino PC retains that insignificant 1fps deficit at 1080p, putting in a score of 53fps here. In Sniper Elite V2, it actually moved ahead of the Firestorm - its score of 196.4fps at 720p leading its rival by around 2fps. Even at 1080p, the Dino remained modestly ahead, tallying 19.7fps to the Firestorm's 18.6fps.

Slim design

Visually, the Dino isn't the most arresting sight. We've seen some groundbreaking cases from Fractal Design, but this 1000 USB3 is very much a budget option. Fairly slim, it does nevertheless come with a number of compromises.

The front is robust but rather unstylish, and the power buttons are awkwardly situated towards the rear of the case's right panel - if you want to place this on the floor, you'll have to do a lot of bending down while turning the machine on. The case isn't really set up for more than two 3.5in drives - you're probably unlikely to need more than this, but it is a limitation - and there isn't much space for extra fans.

Luckily, the Raging Lizard is a midrange system, so the case doesn't need to accommodate top-grade components. Indeed, the case feels airy inside, with plenty of space available to access the memory chips and CPU. It helps that the graphics card is a short single-fan option - the dual-fan version would take up rather more room - and the standard Intel CPU cooler doesn't take up much room either.

We can't say we're overjoyed by the case, but it's more than

adequate for the components contained within. The system always keeps a lid on the power. Rarely even hitting 50W when idling, it only drew up to 104W even with a high load.

There are also a few other features to keep you happy. The 802.11n Wi-Fi is good, and the 24in Iiyama E2483HS is a nice flat-panel at a low price, packing its images with vibrant hues and tones, while retaining strong definition.

We can hardly extend the same compliments to the Gigabyte KM6150 USB keyboard & mouse combo, though. The keys are shallow, soft, and offer very little accuracy, while the mouse buttons feel cheap and unresponsive. Luckily, this PC is highly configurable, and you may wish to run through the options yourself and try to get the keyboard and mouse switched for higher quality equivalents.

You may also want to experiment with the warranty details. We specified the PromoCare option, which gives you three years return-to-base, with two of those also covered by the cost of the parts. You can pay extra, though, and have all three years covered for parts, or the six months of transport cover can be extended to a year or two.

Verdict

The Raging Lizard V2 doesn't so much crash through the competition as tiptoe past it. But that's no bad thing, and for those who don't need the many bells and whistles of more expensive systems, this offers a very tidy array of (generally) well-picked components. We would recommend jettisoning that keyboard and mouse, though. **Robin Morris**

£359 inc VAT**Contact**■ htc.com/uk**Read more**■ tinyurl.com/m6u427b

4.5in (720p, 326ppi) display; 1.2GHz Qualcomm Snapdragon 400, quad-core; Android 4.4 KitKat with HTC Sense 6.0, HTC BlinkFeed; 16GB internal storage; microSD (up to 128GB); 1GB RAM; 3.5mm stereo audio jack; NFC; Bluetooth 4.0 with aptX; dual-band Wi-Fi; A-GPS; Micro-USB 2.0 port with MHL; HTC BoomSound - dual front stereo speakers with built-in amplifiers; 13Mp rear camera with AF and LED flash; 5Mp front camera; video recording up to 1080p; nano-SIM; up to 4G LTE; 8Wh non-removable battery; 137x65x10.6mm; 137g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**SMARTPHONE****HTC One mini 2**

It's now the norm for companies to launch smaller and cheaper versions of their flagship smartphones, which is exactly what HTC has done here. If you can't afford its One M8 (page 79), then the One mini 2 is more likely to be within your budget.

As you would expect, it's smaller than the flagship M8, though, not by much - HTC has shaved 5mm off the width and 10mm from the height. That's enough to make it a more manageable phone, though, especially on the one-handed front.

It's lighter at 137g compared to 160g, which is a good weight for a smartphone. However, it's a little thicker at 10.6mm against its sibling's 9.4mm. It's a little taller than other phones with the same screen size, but it does have front-facing stereo speakers.

Dimensions aside, the One mini 2 retains the design and style of the M8. It importantly has the same premium brushed metal rear cover, which looks and feels great. The cover doesn't run right round to the front of the phone like the M8, so instead there is a plastic band running around the edge.

As is customary for a 'diminutive' smartphone, the One mini 2 has a smaller screen than the flagship M8. It's 4.5in compared to 5in which matches that of the freshly announced Galaxy S5 mini. Whether 4.5in is 'mini' enough for you is another matter. The trend of bigger screens continues, so we're now at a point where mini versions of flagships are the kind of size that flagship devices used to be. If you want a smaller screen then you better look elsewhere.

It's no surprise the resolution is 720p HD rather than Full HD, and although the screen looks good with a 326ppi pixel density (matching the iPhone 5s, tinyurl.com/kn36zee), but you can get this on budget phones such as Motorola's Moto G 4G (page 75).

Under the hood is a 1.2GHz dual-core Qualcomm Snapdragon 400 processor, with 1GB of RAM. The HTC scored 1153 in GeekBench 3, which tallies with smartphones using the same components, such as the Sony Xperia M2 (page 76).

However, it's no slouch and in everyday use, Android is buttery



smooth. Apps are quick to load as are web pages. Scrolling around web pages and maps isn't a chore: it's all nice and responsive. Only on one occasion did we see a hesitation when returning to the home screen.

There's enough power for games, as long as you're not expecting to play the latest and most demanding titles. Games and videos benefit from the front-facing speakers, too.

There's only a 16GB model of the HTC One mini 2, so the only difference between models is the colour. It's a standard capacity now, but we're pleased to report that the handset has a microSD card slot which wasn't on the first HTC One mini. You can add 128GB via the card slot.

Remaining hardware includes dual-band Wi-Fi (not 11ac, though), Bluetooth 4.0 with aptX, GPS and NFC. There's also support for 4G.

The main camera has a 13Mp sensor and is capable of 1080p video recording. Image quality is, however, underwhelming when you zoom in and look at the details, but they're fine for sharing snaps on Facebook.

Videos are also disappointing. Again, there's a noticeable lack of sharp detail. Heavy handed compression means textures tend to turn into smudgy messes.

The front-facing 'selfie' camera has a 5Mp resolution and a timer, so you can get ready for the shot without having to press a button at the right moment. There are crazy effects for softening skin tones, brightening eyes and even changing the shape of your face.

Once again, photos look pretty good until you start zooming in to see the actual pixels. Do this, and you'll see the same degrading effects of compression with an obvious lack of detail.

The One mini 2 comes with Android 4.4.2 KitKat and HTC's Sense version 6.0 - the same as the flagship M8. Sense has always been a decent Android overlay/skin and the latest edition is no exception. It's clean, stylish and easy to use.

It's a shame that the Motion Launch Gestures found on the M8 are nowhere to be seen. These make life easier, allowing you to switch the phone on with a double-tap or use a swipe gesture to go straight to BlinkFeed. HTC has got to differentiate between the One mini 2 and the flagship M8 somehow, and this is one of the obvious ways to do it.

Customisation options do remain, though - namely via different themes, which change elements such as the wallpaper. You can also select or download system fonts and choose which notifications are flagged up by the notification light.

Battery life is on a par with most of the latest Android handsets, which is to say that it easily lasts a day. You might even find it carries on well into the next day if you're not using it too heavily and hammering the 3G or 4G connection.

Verdict

The HTC One mini 2 has the same premium feel as the M8 with only a few downgrades. **✗ Chris Martin**

£400 inc VAT**Contact**■ samsung.com/uk**Read more**■ tinyurl.com/m7mszop

4.8in Super AMOLED display (1280x720, 306ppi); 1.3GHz Samsung Exynos quad-core, 1.7GHz dual-core CPUs; Google Android 4.4.2 (KitKat); 2GB RAM; 8GB internal flash storage; microSDXC up to 64GB; 20.7Mp rear camera; video at 1920x1080 (60fps); dual-band 802.11a/b/g/n; Bluetooth 4.0; A-GPS; NFC; MHL; Micro SIM; 3G and 4G LTE cellular; 2430mAh battery; 71x138x20.2mm; 200g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**SMARTPHONE****Samsung Galaxy K Zoom**

Smartphone cameras are ever improving, but they lack one crucial feature: a zoom. Not so with the Galaxy K Zoom. This Android smartphone has a built-in 10x lens.

The concept of bolting a huge zoom lens to the back of a smartphone isn't new. In fact, Samsung has already tried a couple of times with the Galaxy Camera (tinyurl.com/oqqj937) and Galaxy S4 Zoom (tinyurl.com/pnsw46s). Both were bad products and were arguably the worst of both worlds instead of being the best. They were underpowered as phones, and their cameras weren't particularly good.

Samsung looks determined to make it work third time with the Galaxy K Zoom. It's like a hybrid of the S4 and S5, with 10x optical zoom lens shoehorned in. It's typical Samsung smartphone fare: Android 4.4, S Voice, the Samsung app store and Dropbox pre-installed.

The lens zooms from a nice wide-angle 24 (equivalent) to 240mm, or 4.4- to 44mm in real terms. Its maximum aperture ranges from f/3.1 to f/6.3. The 20.7Mp sensor is the type you'd find in a budget compact camera, measuring the usual 1/2.3in. That's still bigger than the normal smartphone camera sensor, though.

It can shoot 1080p video at 30- or 60fps, and there's the same choice at 720p. Stabilisation is optical rather than electronic. ISO ranges from 100 to 3200, and the continuous shooting mode runs at a claimed 3fps when using autofocus.

There are dual microphones, one at each end of the phone, and a slimline flash and AF assist LED on the rear. You get a dedicated dual-stage shutter button, so it's possible to lock focus and recompose your shot. Using the touchscreen you can choose separate focus and exposure points.

For the smartphone, there's a 4.8in Super AMOLED screen with a 1280x720 resolution. Processing comes from a combination of a 1.3GHz quad-core chip and a dual-core 1.7GHz processor. It's paired with 2GB of memory and 8GB of internal storage. As you'd hope here, you can also pop in a microSD card to add up to 64GB extra.

Compromises have been made to fit a whacking great zoom lens



in a smartphone. At 200g, the K Zoom isn't light and although it's impressively thin for a camera, its 20.2mm thickness means it doesn't slip easily into a trouser pocket.

There's no finger grip as with the old S4 Zoom, and the dimpled plastic panel unclips to reveal a removable battery. You'll want to carry at least one spare around with you to get through a whole day. Shooting lots of video and photos drains the cell very quickly.

From the front, you wouldn't suspect anything was different about this smartphone as it looks just like Samsung's other recent models. The off-centre front camera has a 2Mp sensor, still good enough for full-HD selfies.

The K Zoom has a great screen, if lower res than we'd like. Colours pop on the AMOLED panel, and viewing angles are great. Watching videos is a treat on the 16:9 screen, as is composing photos and shooting videos - you can easily see whether they're in focus or not.

The 'Hexa core' Exynos 5 processor sounds better than it is. For the most part, Android is smooth but during our testing there was the occasional stutter when flipping between home screens and in apps.

Web pages load quickly, and it's quick to zoom around Google maps. Gaming performance is acceptable, with 24.5fps in the GFXBench T-Rex test, but the new Manhattan test ran at just 4fps.

Photo and video quality is not bad, when compared with current smartphones. Shots are generally well exposed and sharp, but you'll

need a steady hand to avoid blur at full zoom. Face detection and tracking system also worked well.


The wide-angle position allows you to capture much more than most smartphones, so it's great not only for landscapes but also indoor group photos where you can't move any further back.

It takes a couple of seconds to launch the camera app, but you can't launch it using the shutter button. You have to press the sleep/wake button or home button, then swipe the camera icon. Fine for most occasions, but don't expect DSLR-like responsiveness.

The screen makes for a great viewfinder, except in bright sunshine when it's difficult to see. The camera app itself is easy to use and allows you to choose picture and movie sizes. By default, photos have 16:9 aspect ratio - fine for the screen but it cuts resolution to 15Mp. It's better to select 20.7Mp and its 4:3 aspect.

Video is decent: detail is good and footage is sharp. Clips look better than the average smartphone video and you get the benefit of zoom while filming. The audio strangely switches from stereo to mono when you zoom in or out. It's good to see a quiet zoom mode that slows down the motor to prevent it making unwanted noise on your videos.

Verdict

By no means the perfect combination of smartphone and zoom lens, it's capable of great photos and videos in the right conditions.  **Jim Martin**

£129 inc VAT**Contact**■ nokia.com/gb-en**Read more**■ tinyurl.com/mox3ppf

Windows Phone 8.1 OS; 4.5in IPS display (480x854, 221ppi); 1.2GHz Quad-Core Qualcomm Snapdragon 400 CPU; Adreno 305 GPU; 512MB RAM; 8GB internal storage; microSD up to 128GB; 5Mp rear camera; Wi-Fi 802.11b/g/n; Bluetooth 4.0 LE; A-GPS (A-GLONASS); GSM 850/900/1800/1900MHz; CDMA 900/2100MHz; 6.7Wh (1830mAh) removable BL-5H battery; micro SIM; 67x130x9.2mm; 134g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**SMARTPHONE****Nokia Lumia 630**

The Lumia 630 is the first smartphone to launch with Windows Phone 8.1. This is a fairly major software update that includes many new features, although some – such as Cortana – won't be available in the UK until later this year.

You can buy the smartphone outright for just £129. There are some compromises, though, notably the lack of 4G support, and there's plenty of competition from budget Android smartphones including the forthcoming Motorola Moto G 4G. The soon-to-launch Lumia 635 adds 4G for an extra £20.

With its removable plastic rear shell it's easy to change the 630's appearance. If black is too sombre there are yellow, orange and green shells, which cost £13 each.

The front is covered with Gorilla Glass 3, with cutouts top and bottom for the earpiece and microphone. There's also an LED-less rear camera, a rear-facing mono speaker and a Micro-USB charging port. Unlike other Lumias the 630 has no dedicated shutter button.

The phone weighs 134g, but feels lighter. It's just over 9mm thick.

Hardware and performance

Aside from the mobile data difference, the Lumia 630 and 635 share the same specifications. Perhaps the biggest compromise – and disappointment – is the low-resolution 4.5in screen. With 854x480 pixels the pixel density is just 220ppi, and you'll notice this when reading text on web pages. It can be fuzzy and difficult to read, which means you have to zoom in more than on a smartphone with a higher-resolution display.

Despite it being an IPS screen, viewing angles aren't the best. A bigger issue is that our sample had clearly visible backlight bleed along the top edge, which was all too noticeable on light-coloured backgrounds. Overall, the backlight was more uneven than we'd like.

Processing power is decent for the most part. The 630 has the same 1.2GHz quad-core CPU as the Moto G, but half the RAM with just 512MB onboard.

In general, Windows Phone 8.1 is snappy and responsive. One notable exception is the camera app.



It's never quick to launch, and can sometimes take several seconds to load, being ready to take a photo only after six or seven seconds – we often missed the moment.

Since our usual benchmark apps aren't available on Windows Phone, we could run only the browser-based SunSpider test. Here, the 630 averaged 1486ms, making it a shade quicker than the Moto G.

There's only 8GB of internal storage, but a microSD card slot lets you add up to 128GB. You also get 7GB of OneDrive cloud storage.

Another disappointment is mediocre battery life. During our testing we were lucky to get through a full 24 hours, and that was with average use. With heavy use you'll need to be near a power socket to make it through a working day.

Annoyingly, the 630 is fussy about chargers. You get one in the box, but try and use a different charger and it will warn you the phone is charging slowly.

A 5Mp camera sits at the back of the device, capable of capturing 720p videos. It's nothing special, with no stabilisation, no LED flash and no HDR mode. The default camera app over-sharpens photos to make them appear more detailed.

There's no front-facing camera, which makes selfies and video chat almost impossible.

Software

Windows Phone 8.1 is the latest version of Microsoft's mobile OS. It also includes Nokia's Lumia Cyan updates, in addition to Microsoft's tweaks.



You can have up to six columns of tiles on the Start Screen, and choose an image rather than a block colour as a background wallpaper. There's a nice parallax effect, which looks great and makes the phone feel more personal.

Action Center finally brings notifications to Windows Phone. As in iOS and Android, it's accessed by swiping downward from the screen's top. You can choose which apps you want to receive notifications from. There are also four customisable tiles for quick settings.

There are other tweaks, too, such as lock screen themes, a calendar that integrates weather, and a Word Flow keyboard with personalised predictive text and Swype-style gesture typing. A set of Sense features help you manage data usage, storage and Wi-Fi.

And then there's Cortana, Microsoft's digital assistant (see page 91), but for now it's available only with the phone's region set to US English. This is also the case with reminders and Quiet Hours.

Nokia adds its own selection of useful apps, including the excellent HERE Drive+ satnav with offline maps and Nokia MixRadio.

Verdict

If you're considering the Lumia 630 as a first smartphone and you don't plan to buy lots of wireless accessories and install lots of apps, it's not a bad choice. Windows Phone 8.1 is very easy to use, and will improve when Cortana arrives in the UK. Don't buy it if you want to use Skype, though. **✉ Jim Martin**

£116 inc VAT**Contact**■ xfxforce.com**Read more**■ tinyurl.com/Lv69bem

AMD Radeon R7 265;
2GB GDDR5 RAM; 900MHz
clock (925MHz Boost);
1.4GHz memory clock
(5.6GHz DDR effective);
256-bit memory interface;
64 texture units; 32 ROP
units; PCI Express; DirectX
11; 2x DVI; 1x HDMI; 1x
DisplayPort; 1x 6-pin PSU
connectors needed;
2-year warranty

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆

**GRAPHICS CARD****XFX Radeon R7-265 2GB Core Edition**

The AMD Radeon R7-265 will be of interest to the typical PC user, rather than those who sweat over the couple of extra frames available from cards costing three times the price.

The R7-265 nestles around the £120 mark, which puts it in direct competition with nVidia's GTX 750 Ti. We aren't completely taken with this rival - revolutionary, yes, and able to conserve power beautifully, but it offers nothing new at the price point in terms of performance.

AMD's Radeon R7-265 is rather more conventional, caring less about energy saving - chips at this level of speed tend not to demand prodigious amounts of power in any case - and concentrating instead on hammering out the very best framerates for the money.

The first thing to note is that there isn't much that's very new about the R7-265. It's built around the Pitcairn Pro technology that was released two years ago and powers such AMD stalwarts as the 7850. And while the 265 here has higher clock speeds than the 7850, many of the specs are identical. So both have 64 texture units and 32 raster operations, for instance. They even have the same number of transistors onboard (2.8 billion).

The absence of new technology has its drawbacks. Whereas the 260X, for instance, is relatively fresh, and has pleasing 2014 features such as TrueAudio, the 265 offers nothing like that. So don't just assume that the 265 is a slightly faster version of the 260X.

In terms of speed the 265 is very closely related to the 270. Both come with a standard core speed of 900MHz, pushed to 925MHz courtesy of the Boost clock.

Both the 265 and 270 also have a memory clock of 1.4GHz (5.6GHz effective when you take into account the quadrupling effect of the DDR5 memory). These are considerably ahead of the 7850's speeds.

The 260X we reviewed had very different specifications from the 265, and the 260X listed a core clock of 1175MHz, and an effective memory clock of 6.5GHz.

In fairness to the 265, though, this GPU comes with a 256-bit memory interface, whereas the 260X's version is a paltry 128-bit.



This means the 265 trounces the lower card when it comes to memory bandwidth - 179.2GB/sec to the 260's figure of 104GB/sec.

The 265 has more texture units as well (64 to the 260X's 56), although the 265's lower clock speeds consign it to defeat here, producing a texture fill rate of just 59.2GT/sec to the 260X's 65.8GT/sec.

nVidia's 750 Ti also fares poorly on fill rates. It also takes a 128-bit memory interface half the width of the 265's, and slumps to a memory bandwidth figure of 86.4GB/sec - under half that of the 265.

The 750 Ti's texture fill rate of 44.GT/sec is poor, too, languishing far behind the 265.

The 265 comes with 2GB of GDDR5 memory, typical for a card at this price point.

Performance

In terms of performance, the XFX Radeon R7-265 2GB Core Edition performed well, coming a short distance behind the 270, but finishing some way clear of the 750 Ti and 260X.

In Crysis 3, for instance, the 265 hit figures of 30- and 20fps at 1900x1200 and 2560x1600 respectively, whereas the 750 Ti finished a short way behind, on 28- and 19fps.

The 270 was only marginally ahead of the 265, scoring 31- and 21fps. The results were similar in Bioshock, with the 265's figures of 60- and 36fps superior to the 750 Ti's 58- and 35fps. (The 260X was even further back, on 56- and 34fps.) The 270 was a short distance ahead of the 265, on 62- and 37fps.

The distance between the cards grew as we got to less demanding

fare. In Stalker: Call of Pripjat, for instance, the 270 was significantly clear of the 265 at 1920x1200, getting 76- to the 265's 72fps.

The 750 Ti was some way back again, on 67fps, with the 260X struggling on 65fps. The gaps were the largest on BattleForge, where the 265's score of 71fps put it roughly halfway between the 270's 77fps and the 750 Ti's 66fps. The 260X, once more, trailed in their wake, on 62fps.

Of course, nVidia enthusiasts would point out that the 750 Ti is lower on power, citing a TDP of 60W as opposed to the 265's 150W.

In practice, the 265 was drawing around 50- to 55W higher than the 750 Ti during games testing, so the difference wasn't as large as the TDP might suggest. Nonetheless, the 750 Ti is easier on power.

You may not care about the 265's higher consumption, although those who like to push overclocking settings to the max will probably find there isn't much room for improvement when it comes to the 265. And it is beautifully discreet, generating very little noise for a card of any price point.

Verdict

It's difficult to get excited about the 265. Nonetheless, it serves an important purpose for those who have a very specific budget. We certainly wouldn't recommend the 750 Ti over this card, as the 265 is very much the superior product in terms of performance. It's a shame that it doesn't have the features of some of the newer AMDs. As a value for money product, though, the 265 is another very capable addition from AMD. **Robin Morris**

£2,100 inc VAT**Contact**■ panasonic.co.uk**Read more**■ tinyurl.com/om6yhLn

50in LCD TV; 3840x2160; 2x Freeview HD, 2x Freesat tuner; Freetime rollback EPG; 18W (2x 4W + 1x 10W) audio system; 4x HDMI 2.0; DisplayPort; SCART/component (YPbPr)/composite via adaptor; stereo phono audio input; digital optical audio output; SD card slot with 4K playback; 3.5mm headphone jack; 10/100 ethernet; 2.4/5GHz 802.11 Wi-Fi built-in/Wi-Fi Direct; screen mirroring; 2x USB 2.0, 1x USB 3.0; HEVC decoder; 138W specified power consumption; 50W measured 100 percent red field power consumption; 1131x673x42mm

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**4K TV****Panasonic TX-50AX802**

Panasonic's 50in TX-50AX802 combines Ultra-HD (4K) resolution and advanced picture processing with Freetime, arguably the most seductive catch-up TV service yet.

And, at around £2,100, it's clear evidence that 4K is beginning to usurp 1080p at the large-screen end of the TV aisles. Joining this 50-incher in the AX800 series is the 58in TX-58AX802 and 65in TX-65AX802.

Reassuringly, there's nothing budget about the build. Tipping the scales at a hefty 24kg, this metallic-trimmed set is convincingly premium. An unusual counterweight pedestal block, fitted out of sight behind the screen, gives the illusion that the TV is resting on nothing but a slim chromed frame.

The AX802 has dual Freeview HD and Freesat tuners, and includes a camera that automatically pops up from the bezel when required for Skype or facial recognition.

Connections include four HDMI 2.0 with audio return channel (ARC), PC-friendly DisplayPort, three USB, ethernet and a 4K video-compatible SD card slot. Wi-Fi is built in.

The set also ships with two remotes, a particularly handsome IR controller with a metallic finish, and a Bluetooth Touch Pad with a built-in microphone for voice commands.

What's on TV

Freetime, the rollback EPG, first came to light on the Freesat satellite platform. Here it's evolved to work with either the Freeview or Freesat tuner, and greatly simplifies catch-up viewing from the main broadcasters (BBC iPlayer, ITV Player, 4OD and Demand5). With Freetime there's no need to fire up individual apps, just scroll back to find the programme you want using the guide.

Aside from catch-up TV, the AX802 lists Netflix, Vimeo, BBC News & Sport, Wukai.TV, Skype and Dailymotion among its apps. Panasonic's distinctive my Home Screen UI provides a solid launcher for all these services. You can choose a home screen from a selection of presets, or just arrange your own using a blank grid.

The AX802 also introduces my Stream, a curated content recommendation engine that filters

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RECOMMENDED**

broadcast content, YouTube clips and other sources. You can fine-tune recommendations using a star icon on the Bluetooth controller. There's also provision to recommend content for other family members with a registered my Stream profile.

Interestingly, while the TV does have an HEVC decoder (the compression standard favoured for delivering 4K video from the web), it's not compatible with the Netflix 4K service, apparently due to unforeseen incompatibilities between Panasonic's chosen chip architecture and Netflix.

This incompatibility may or may not prove a significant failing in the long term, but certainly while UHD content sources remain scarce it's a blow. You can, however, stream 4K demo content from Panasonic's own UHD channel.

File compatibility is wide. We played MOV, AVI, WMV, MPEG and MKV across a network from a NAS and a USB stick; audio support covers WMA, MP3, AAC/M4a and FLAC. The Panasonic TV also supports Miracast mirroring with compatible Android and Windows Phone 8.1 smartphones.

Performance

Picture performance is terrific. Many might wonder if a 50in 4K screen brings the same viewing benefits as a larger UHD panel. The good news is that with native 4K content the image positively prickles with extraordinary detail.

For this audition we created our own 4K video content shooting

sequences on Panasonic's GH4 system camera. Our 3840x2160 resolution material shot in MP4 H.264 at 30fps looks absolutely stunning on this screen.

The TX-50AX802's deliciously inky black-level performance is coupled with outstanding colour performance, creating lush, dramatic images. There is some unevenness to the backlight, but this isn't apparent during normal viewing.

Motion handling is extremely good, provided you keep Intelligent Frame Creation processing to the minimum. In this mode you get maximum motion-image clarity with hardly any motion artefacts, making it great for sports.

3D is of the active-shutter variety, and effective. Two pairs of glasses are provided and, while there's some inevitable crosstalk, pictures are for the most part wonderfully deep and dynamic.

Sonically the set is effective, although the soundstage is monophonic, as most of the audio is directed out of a central rear facing speaker. Some mild sense of stereo can be gleaned from a pair of downward-firing drivers used for higher-frequency detail.

Verdict

The Panasonic TX-50AX802 is a thunderously fine UHD flatscreen, capable of outstanding 4K picture quality. Detail, dynamics and colour depth are all first-class. The set also looks great with full-HD and upscales Blu-ray content with considerable finesse. **Steve May**

£479 inc VAT (8TB)**Contact**■ wdc.com**Read more**■ tinyurl.com/Ltcnfex

2-bay NAS drive; available in 0/4/6/8TB capacities; supports Raid 0/1/JBOD; 1x gigabit ethernet; 2x USB 3.0; 172x155x99mm; 2.3kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**NAS DRIVE****WD My Cloud EX2**

WD's My Cloud range is catering to home- and small-business users who might normally be intimidated by complex NAS drives. The dual-bay My Cloud EX2 is another attractive addition to the range.

The EX2 is a dual-bay Raid drive that provides remote access over the internet via WD's My Cloud service and apps. It's very similar to the My Cloud Mirror, sharing the same basic design and 1.2GHz processor, along with 512MB of memory, a single gigabit ethernet port for network connectivity, and a pair of USB 3.0 ports for adding extra storage.

However, the black livery of the EX2 marks it as a member of WD's 'Expert' range, and it does offer business users a few extra features that the white, consumer-oriented My Cloud Mirror lacks.

Both drives are available with 4, 6- or 8TB of storage but, unlike the My Cloud Mirror, the EX2 can also be bought unpopulated, allowing you to provide whatever capacity or brand of disk you prefer to use.

Other additional features include support for IPv6, Active Directory for managing groups of users, and data encryption for extra security.

Prices start at £199 for an unpopulated drive, and then £299 with 4TB storage, £359 for 6TB and £479 for 8TB.

Those prices are competitive, but if you don't need the extra features of the EX2 you can save another £30 by opting for the My Cloud Mirror. One sign of compromise here is that the thin plastic casing of the drive feels rather flimsy, as do the little plastic tabs that you use to pull out the drives when you need to replace them.

Like all the drives in the My Cloud



range, the EX2 does a good job of simplifying the initial set-up process for less experienced users. You need to download the My Cloud software from WD's website, and that can then detect the drive on your network and perform some quick diagnostics before walking you through the installation process.

Software

Once that's done you use the drive's browser-based Dashboard interface, which provides simple, well-organised options for adjusting settings such as the Raid format, setting up shared folders and the My Cloud remote access option.

More advanced users can also download third-party apps designed specifically for the EX2, including the Squeeze streaming audio server, aMule for P2P file-sharing, and even Wordpress for hosting your own blogs.

The only glitch we encountered while setting up the EX2 was in the skimpy Quick Start guide, which didn't tell us the default user name and password required to open the Dashboard. That's a careless mistake, which meant we wasted a fair bit of time trying to guess those details before contacting the manufacturer for help.

We tested the 8TB version of the EX2, which was preformatted

using Raid 1 mirroring by default, but it took just a couple of minutes to reformat the drive as Raid 0 to check maximum performance.

Using the CrystalDiskMark benchmark for Windows, the EX2 produced very solid sequential read- and write speeds of 103- and 80MB/s respectively.

Performance was much poorer with smaller file sizes - just 0.7- and 6.7MB/s for 4kB files - but that's a common weakness of network drives.

Power consumption during testing averaged 15.5W, with the occasional peak of up to 18W, but that dropped to just 6W when the EX2 was idle. Leaving it running all day shouldn't do swell your energy bills much.

Verdict

The WD My Cloud EX2 NAS drive has a few minor faults, but it's easy to use and provides good performance and reliability at an attractive price. More sophisticated NAS drives are available for larger businesses, but the EX2 provides all the features that home users and small businesses are likely to need, and presents them in a straightforward manner that will appeal to people who might never have used a NAS drive before.

✉ **Cliff Joseph**



£120 inc VAT**Contact**■ trendnet.com**Read more**■ tinyurl.com/Lon6j6f

Dual-band wireless 802.11ac router; 3x3 MIMO; 802.11a/b/g/n/ac; three internal antennae; 1x USB 3.0 port; 1x USB 2.0; DD-WRT compatible; Broadcom TurboQAM; 4x gigabit ethernet LAN; 1x gigabit ethernet WAN; 48x155x180mm; 395g

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

**WIRELESS ROUTER****Trendnet TEW-818DRU**

The upright, book-like design of the TEW-818DRU – TrendNet's first 802.11ac router – is hardly inspiring. But its trump card isn't its looks, but the potential value for money it offers. It has an excellent specification and costs £120, slightly less than many 802.11ac routers.

For that moderate outlay, you get a 3x3 MIMO (three-stream) 802.11ac router, which is by no means a standard feature on all 802.11ac equipment, since some only provide two streams, which limits the maximum wireless speeds they offer.

Using Broadcom's chipset, the TEW-818DRU also supports its proprietary TurboQAM, a technology that claims to boost 802.11n speeds from 150Mb/s per stream to 200Mb/s, as long as the connected wireless client also supports it.

It achieves this by increasing the modulation scheme from 64-QAM to 11ac's 256-QAM, but is specific to wireless receivers that use the Broadcom BCM4335 chipset.

Along with the usual four gigabit ethernet ports for wired networking, plus another one for a WAN connection, you also get a pair of USB ports at the back, one USB 2.0, one USB 3.0. There's also a WPS button and a on/off power switch.

DD-WRT compatibility is listed, and you can download open-source firmware from Trendnet's site. This partly addresses the modern concern of anyone worried about potential backdoors written into the



code, but it still requires a level of expertise to audit the code.

The software interface of the TEW-818DRU is plain, at least compared with the JavaScript-heavy visual interface offered by firms such as Asus and Linksys.

While there's a good range of options, such as guest networks, port forwarding and a firewall, split into Basic and Advanced sections, some are rudimentary, at best.

The parental controls feature is simply an empty table for you to add blocked sites to, and manually apply to a range of IP or MAC addresses. It's hardly user friendly, though.

The processor is a 1GHz Broadcom chip, but the interface wasn't as responsive as we'd have liked. Switching pages was near instantaneous, but adding entries to tables required a 15-second wait before the page reloaded.

The USB function didn't work well. We plugged in a range of devices and they were clearly detected in the USB section of the router's software. But the devices didn't automatically show up on the network, either in Windows or OS X.

We finally managed to access them by entering the IP address of the router. Write speeds of 6.4MB/s are poor compared with the double-digit transfer rates now possible from some high-end routers.

We tested the wireless performance of the TEW-818DRU with the Mac software WiFiPerf, for a clear view of performance without any potential bottlenecks such as disk transfer rates.

Using a 2013 MacBook with 802.11ac Wi-Fi, but which doesn't support Broadcom TurboQAM, we measured speeds using 802.11n

and 802.11ac protocols. This was tested at one metre and two metres with clear line of sight between the router and laptop; then again at eight metres, with a small partition wall in between.

On 2.4GHz 802.11n, the TEW-818DRU performed very well. At 1 metre, we recorded 153Mb/s when transferring from client to server, and a slightly lower 150Mb/s rate from server to client.

When tested at a distance of two metres, speeds were roughly the same, namely: 158Mb/s client to server and 150Mb/s server to client.

But at distance, our 802.11n results were erratic. A two-minute data transfer from the laptop to the sever yielded an average transfer rate of 79Mb/s. While that looks reasonable, it dropped to far lower speeds, and was occasionally faster too. Transfers from the server to the laptop were more stable, averaging a more consistent 126Mb/s.

Over 802.11ac, short-range results were again excellent. Client to server speed at one metre was 540Mb/s, while from server to client it reached 547Mb/s. At two metres, this dropped slightly to 443Mb/s and 535Mb/s from server to client.

And during our final test at long range, the TEW-818DRU was as choppy on 802.11ac as it was on 802.11n, with bursts around 200Mb/s, but dropping out for short periods. The average speeds we recorded were 48Mb/s from client to server and 99Mb/s from server to client, which are worse than the results for 802.11n. This is a major disappointing blip in its results.

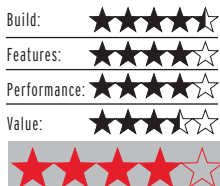
Verdict

Thanks to a 3x3 MIMO configuration, the TEW-818DRU short-range performance is up there with some of the fastest 802.11ac routers, but it was less impressive at long range. The software is not as good as the interface found on more familiar models from Linksys, Asus and others. Its USB function didn't work well, either. While some of the premium models cost over £150, the price of the TEW-818DRU isn't that far behind. We say spend a little more for a router with consistently good results, such as the Asus RT-AC68U. **Orestis Bastounis**



£199 inc VAT**Contact**■ y-cam.com**Read more**■ tinyurl.com/pq343qr

IP camera; 1Mp (1280x720) resolution; 1/4in CMOS sensor; IP66 rated for weather- and water-proofness; 802.11b/g/n; 24x LED for IR night vision; H.264 (MPEG-4) video compression; mic; 10/100 ethernet (supports PoE); 12V 3.75W adaptor with 10ft cable; wall mount and fixings; 410g

**IP CAMERA****Y-cam HomeMonitor HD Pro****PC ADVISOR
RECOMMENDED**

Keeping an eye on your kids, pets or property via an app on your smartphone is easier than ever thanks to the latest generation of IP cameras. The HomeMonitor HD Pro is the latest in Y-cam's HomeMonitor range: a weatherproof outdoor camera for wall mounting. If you only need an indoor one, then the HomeMonitor HD is less than half the price. Both models have night vision, to capture video 24/7. Using infrared LEDs at night, footage is black-and-white, rather than colour.

Both models have a resolution of 1280x720 - which is three times more pixels than VGA IP cameras, with their 640x480 resolution.

Movement detected

As well as letting you watch the live feed, the HomeMonitor records video clips when there's movement detected in certain areas. Both the live feed and recorded videos come via 'the cloud' rather than directly from the camera as all your video is routed via Y-Cam's servers.

There are pros and cons to this method. First problem, the live feed isn't live. It's delayed by around 15 seconds in our tests. That's not usually a problem as you'll get a motion alert on your smartphone almost the instant motion is first detected. Second problem - there's no alternative storage. You can't put a memory card inside the camera as you can with the UCam247-HD01080 (tinyurl.com/qbdaurt), nor can you set a NAS drive as the destination for recordings.

While that will bother some, for the majority it means the HomeMonitor is hassle-free. Y-cam saves the last seven days' worth of recordings for free (safer from deletion or theft) and means you don't have to add your own storage or leave a NAS drive on 24/7.

The downside is that the full-quality setting from the camera is lost, as the cloud system is optimised for broadband speeds. You can download recordings and keep them, but you'll need to do so before they're deleted, after a week.

Unlike older cameras which were a pain to configure and required expert network knowledge, the HomeMonitor cameras can be set up for remote viewing by anyone.



While you still need to start with a web browser on a laptop or PC, and a network cable connected between the camera and your broadband router, clear instructions make installation a breeze. You head to the HomeMonitor website, create a free account, type in the camera's unique ID and you'll then see the video feed there on the page.

Assuming you want the camera to connect via Wi-Fi, you select your wireless network, enter the password and then relocate the HD Pro to wherever you want it viewing.

Everything is supplied in the box, including a wall-mounting bracket through which wires run. This does mean drilling holes in your wall, but you'll need to perform some DIY anyway to provide power. The HD Pro supports power over ethernet (PoE), a handy option although few UK homes are wired for PoE.

The final step is to choose camera settings, like defining one or two motion-detection zones and a time schedule for detection. For outdoor use, it makes sense to leave it on permanently; indoors, you might want to enable recording only when you're away from home.

Live streams

You log in to your account on the HomeMonitor website to watch live streams and play recordings, and apps are available for iOS, Android, Kindle Fire and Windows Phone 8.

The easy-to-use website and apps have a similar look and feel. For example, the main screen in the iPhone app shows the list of cameras with three buttons next to each. Tapping on the video thumbnail starts the live stream with audio, and the buttons let you toggle the camera on and off, enable and disable motion recording, and choose to receive motion alerts.

Swiping right brings up a list of the last seven days, and you tap a day to access recordings. Each one shows the time, camera name and duration - so even with multiple cameras it's easy to keep track.


Image quality is good, virtually identical for indoor and outdoor models. A wide-angle view means you see plenty in the frame, and the framerate is smooth. It lacks some detail compared with the full-HD UCam247-HD01080 but it benefits from smoother playback.

Colours are accurate during the day with enough detail to recognise faces and registration plates. There's less detail at night, and it's harder to recognise even familiar faces because of the infrared. Number plates tend to reflect light too, so they're not readable - issues faced by all IR cameras. Quality is identical for Wi-Fi or 3G/4G streams.

As a package, the HomeMonitor HD Pro is the best wireless IP camera we've seen. Image quality could be better, but it's easy to set up with a great website and apps.

There are enough options to be useful without overwhelming less technical users, and the cloud storage system works well.

Verdict

The HD Pro isn't the cheapest IP camera, but with no subscription costs, it's still great value. The indoor version - the HomeMonitor HD - is even better value now you can find it for £100.  **Jim Martin**

£99 inc VAT**Contact**■ canon.co.uk**Read more**■ tinyurl.com/oz3n94y

Ultra-compact photo printer; 300x300dpi maximum resolution; 47 seconds per postcard-size print specified speed; 18-sheet maximum input capacity; USB 2.0 interface; Wi-Fi 802.11b/g; 178x127x60.5mm; 810g

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

**PRINTER****Canon Selphy CP910**

Canon's chic little Selphy CP910 is an upgrade of the CP900 it released in 2012 and has been issued in attractive glossy black or white editions. It's extremely lightweight (810g without the ink cartridge) and can easily be slipped into a rucksack or overnight bag as it measures only 178x127x60.5mm.

Preparation for use is simple – just drop down the side panel and slot in the cartridge. Then fill up the supplied plastic paper cassette with the required media, lower the front panel and click it into place.

The first incarnation of this model – the Selphy CP800 – made the mistake of omitting Wi-Fi connectivity and while the CP900 attempted to correct this by including Wi-Fi printing, you still couldn't use Wi-Fi Direct. The CP910 has finally got it right and you can now print from an iOS, Android or Windows RT device by downloading the Canon Easy-PhotoPrint app and scrolling through the menu on the 2.7in colour display to the Direct

Connection option. Set your smartphone's Wi-Fi settings to the revealed SSID, enter the password and you're all set.

The USB port on the side will allow for PC or Mac connection or for flash drives and PictBridge printing and SD card photos can be accessed via the slot on the front. The control buttons and menus are very user-friendly and the LCD can be tilted to 45 degrees for better viewing.

Print times on the CP910 remain the same as before – in other words a slightly sluggish 47 seconds for a postcode-sized photo and just under 30 seconds for credit card-sized images and mini stickers. This is mainly because you have to do several passes with the dye-sublimation thermal transfer printing system to arrive at the finished article.

The quality of the photos remains impressive, though, with sharp definition and true colours. A certain amount of onboard editing allows



you to achieve smooth skin, correct red-eye and even opt for sepia or monochrome prints, plus you can create ID photos of varying sizes.

The Canon 4x6in ink and paper set KP-1081N will deliver 108 prints for £34 (or £25.34 on Amazon) and an optional battery unit will set you back £80 at 36 prints per charge.

Verdict

If you already own the Selphy CP900 there will be no need to upgrade to the CP910 unless you want to make the most of direct Wi-Fi printing. However if you're starting from scratch, this will make a perfect, versatile addition to any home office. **✉ Martyn Clayden**

£60 inc VAT**Contact**■ brydgekeyboards.com**Read more**■ tinyurl.com/L6v8zs2

Bluetooth keyboard for iPad 2/3/4; Bluetooth speakers; 524g

iPAD KEYBOARD**Brydge+ with speakers**

Although there's not yet a version of the Brydge for the iPad Air, those with an iPad 2, 3 or 4 will appreciate the excellent build quality of the Brydge+. Its design mirrors the MacBook and more than once we reached for the non-existent trackpad, such is the similarity.

Of course, it's scaled down to fit the iPad's dimensions and the keys are smaller, but we found it no problem to touch type. There's plenty of key travel and the layout is about as close as you can get to a MacBook. There's one criticism – this is a US keyboard with a US layout and \$ rather than £ sign.

Constructed from aluminium, with plastic keys, the Brydge+ looks and feels the part. Thanks to a recent price cut, it's now cheaper than many inferior alternatives.

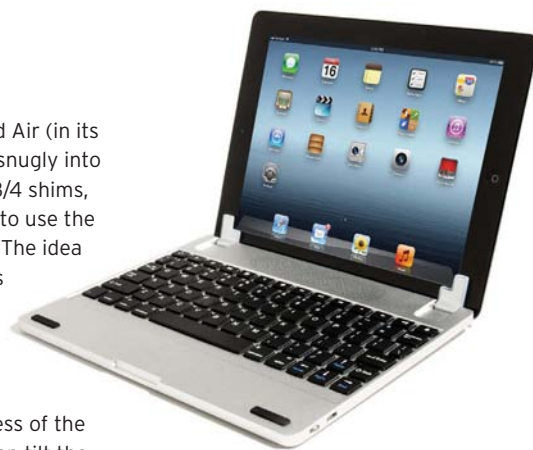
Your iPad slots into the hinges, and is held in place by the friction of the rubber inserts. The keyboard arrives to fit a third- or fourth-generation iPad, but shims for the iPad 2 are in the box.

PC ADVISOR
RECOMMENDED

We found that our iPad Air (in its Apple Smart Case) fitted snugly into the hinges with the iPad 3/4 shims, so it's eminently possible to use the Brydge+ with an iPad Air. The idea is that you use a case-less iPad as you can leave it attached to the hinges in the 'shut' position.

We were particularly impressed with the stiffness of the hinges and the fact you can tilt the iPad back to almost 180 degrees. This means you can always get a comfortable working angle whether you're using it on your lap, on an aeroplane or on a desk. Plus, thanks to the weight of the keyboard (524g) you can tilt your iPad back without the keyboard tipping up in the air.

The model we tested included Bluetooth speakers, but you can get the speakerless version if you really don't want them. However, as you'll save less than £10, it really isn't worth it. The speakers can be paired at the same time as the keyboard to listen to music while you type.



The speakers deliver the kind of bass-light sound you'd expect from any laptop. However, they're still a huge improvement over the iPad's single speaker because they're facing you and they're much louder.

There's a polycarbonate model too (with speakers) which costs £47.

Verdict

The Brydge is the best iPad keyboard we've tested. It's great if you don't want to carry your iPad and laptop around as it's good for typing long documents. As a bonus, it's not even expensive. **✉ Jim Martin**



7 most expensive in-app purchases

David Price rounds up wallet-busting in-app purchases that iOS users on a budget should probably avoid

One of the best things about iPhone and iPad apps is that they're cheap. PC owners routinely spend £15- to £30 on a game (and console gamers are often charged £40 a time), while desktop software packages are frequently more than £20. But a £4.99 iPad or iPhone app is considered pretty expensive, and there's a huge selection of titles for a couple of quid - or even for free.

But the dark side of this apparent generosity on the part of the software publishers is the in-app purchase (IAP), which for many apps and games is the part of the equation that makes the real money. Many games operate a 'freemium' model, in which the initial download costs nothing but a host of extras (for additional characters, levels or features, or to skip tedious waiting periods built in to encourage you to crack open your wallet) cost you anywhere from 69p to a few quid, or, in some cases, even more.

Here we count down seven of the most outrageously expensive IAP items we've seen in iPhone and iPad apps and games. Each must be a tangible item, feature or character, rather than simply an injection of in-game currency.

7. Princess Celestia

• £20; *My Little Pony: Friendship is Magic*
Princess Celestia now costs roughly half of what she did the first time we spotted her. There does seem to be a growing backlash against ruinously expensive IAPs, particularly in games aimed at children, and a few have responded by dialling back the more extreme examples.



We say children, but did you know that a big proportion of *My Little Pony* fans are adult males? Surprising (they are known as Bronies), but a nice fan base to have when it comes to IAPs on the tie-in iOS game.

There are loads of ponies to unlock in this smartly realised freemium title, but to get the lot would take months of work. Or the injection of some cash.

6. Koenigsegg Agera R

• £55; *Real Racing 3*

Real Racing 3 is the third instalment in a noble racing series, boasting beautiful visuals and gameplay that many love. Less

pleasingly, it was the first in the series to operate a freemium model, with the initial download free but most of the unlocks demanding either long-winded grinding or the purchase of 'gold' with real-world cash.

The most expensive car in the game clocks in at 800 gold; a pack of 1,000 gold costs £69, so by our calculations the Koenigsegg Agera R is worth £55.

It's possible that, like *My Little Pony*, *Real Racing 3* will pull back on the 'spend, spend, spend' side of things; it seems to have prevented new users in the current version from buying high-powered cars right at the start, requiring unlocks before players can access the advanced sections of the store.



5. God mode

• £58; *Super Monster Bros*

Tip of the hat to IGN for discovering this execrable example of the rip-off merchant's art, which has since, happily, been taken down. There are games that offer more expensive individual IAPs, but few can be so shameless.

Of the six playable characters, one was available for free and the others cost anywhere from \$4.99 to an utterly astonishing \$99 - that's nearly £60. You got a limited number of fireball-style ranged attacks, and topping up your supply cost \$0.99 a time; and when you died the game offered a sort of God mode cheat (attacks and energy set to infinity) that also set you back \$99.

In gameplay terms it was total tripe, too: the most appallingly basic and derivative platform game drivel, with gaps you couldn't fall down, feeble effects, and visuals and



sounds that seemed to have been lifted wholesale from other games.

4. Nanotech Sniper

• £64; Contract Killer

Contract Killer is a charmingly amoral game of systematic murder, an activity that can be made more efficient by the use of the Nanotech Sniper Rifle. The only problem is, it'll set you back more than £60 in game currency.

Contract Killer 2 is more reasonable, asking the equivalent of only £40 for its most costly armament (the Hellfire).

3. Infinite Knives

• £134; Deer Hunter Reloaded

The most expensive gun (or rather guns) in Deer Hunter Reloaded are a trio of – in our eyes – ludicrously overpowered firearms: the .50 SpecOp, MIL-3000 Assault and Elkmaster Pro, each of which cost 5,000 gold (the equivalent of £67) and presumably pack enough firepower to stop a brachiosaurus.

But then we checked the Items tab, and found the Infinite Knives upgrade, twice as costly as those bargains above. At £134 they had better be high-quality knives.

2. Apathy Bear

• £394; Gun Bros

Sometimes an app can disguise how expensive is an upgrade by charging in-app currency for it, instead of real money: hey, that's not expensive, it's only 30 Magic Coins. But if the in-app currency is itself for sale – and if the game makes it difficult to earn enough currency to pay for its best gear – then you can pay through the nose.

Gun Bros is a perfectly fun multiplayer shooting game, but it's notorious for its extravagantly named and priced weaponry upgrades. The most costly piece of firepower is the Apathy Bear ("This gun filters a child's love through a screen of inverse anti-matter sub-particles, killing your enemies with the most adorable haemorrhages imaginable"), which costs 3,999 'War Bucks'; this took top spot from the Kraken gun, a snip at 3,499 War Bucks (£300).

To give you a feel for the prices, the game gives you 3 War Bucks to get started with. You can earn War Bucks in-game, but it's a slow process. Or you can buy them as

IAPs. A pack of 710 costs £69, making the Apathy Bear worth about £394.

1. Diamond Chisel

• £47,000;

Curiosity: What's inside the Cube?

Legendary game designer Peter Molyneux recently expressed his unique vision for gaming in the form of Curiosity: What's inside the Cube?, an iOS game/social experiment/ingenious extended marketing stunt.

Lots of people pointed out that the free app really just involved clicking pixels on the surface of a black cube, but they still queued up to play nonetheless. It was based on the oldest narrative device in the book: unlocking a mystery. Each layer of pixels removed by the participants revealed something new, and right at the inside lay the final secret, which Molyneux promised would be a life-changing experience for the first person to see it.

Perhaps unsurprisingly, given that Molyneux had said the game was "a test about the psychology of monetisation", there were IAPs. And one of them was as far we're aware the most expensive bonus item yet seen in an iOS app. The Diamond Chisel, which increased the player's tapping strength by a factor of 100,000, cost an astonishing 3bn in-game coins, which translates to £47,000.

Funnily enough, the lucky winner had started playing only the day before making it through to the core – a sickener for the other players, we'd guess, and one in the eye for anyone who shelled out on a diamond chisel.

The life-changing reward? To be the god figure in Molyneux's next game, deciding how it plays out and how the world develops. ☒



WINDOWS UTILITY

Auslogics BoostSpeed 7 Premium

\$50 (£29, 3 PCs)**Contact**

■ auslogics.com
 Read more
 ■ tinyurl.com/k7zd8mq

System requirements

Windows XP/Vista/7/8

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



There are a lot of applications that claim to speed up and clean up your PC, but few as comprehensive in what they offer as is Auslogics BoostSpeed 7 Premium.

There are three different automated fixes, labelled Disk Space, Computer Stability and Computer Speed. Each of these works through a three-step wizard, which runs a scan to show what needs doing, offers you the chance to tailor how it does it, and then perform the fix.

On our test machine, a typical legacy specification but with perhaps less clutter than a heavily used office machine, it took just under a minute to scan 600GB of hard disk in six partitions. It highlighted 323MB of recoverable space, 115 stability issues and 62 speed issues. It then took around three minutes to run fixes.

As well as the three core features, the All Tools screen shows functions listed under Speed Improvement, Disk Management, OS Management and Privacy Protection. Speed Improvement includes a flexible disk defragmenter and Registry cleaner/defragmenter. Startup management lets you tweak the processes which kick in at startup.

Disk Management adds a duplicate file finder and disk doctor, to a disk explorer and uninstall manager. The disk explorer shows



After **SCANNING YOUR PC**, Boostspeed reveals the health of your system

which programs use the most space, although you're more likely to uninstall an app because it's causing trouble than because of its size?

The Disk Doctor is more useful, as it can find and fix disk errors. It spotted errors on one of our test disks and fixed them, but it didn't say what they were, so Windows Scandisk might have done as well.

The most important question is does BoostSpeed increase speeds? We timed Windows startup, to the end of any obvious disk access after the desktop had appeared, the startup of Chrome and Word and the scan time of a set folder, using Microsoft Security Essentials.

Start-up on our, reasonably clean, testbench machine took two

minutes, 11 seconds before running the BoostSpeed wizard and relevant tools; and two minutes, nine seconds after. This is not a huge difference, and the MSE scan took exactly the same time before and after, too.

The application start ups showed more improvement, with the Chrome browser taking nine seconds where before it had taken 12 seconds and Word starting in an impressive three seconds, less than half the time as its previous seven seconds.

Verdict

BoostSpeed may improve the speed of your Windows PC, but the housekeeping and repair facilities are just as important, and there are lots of them here. **Simon Williams**

DISK UTILITY

O&O DiskImage Professional 8

£20 inc VAT (1 PC)**Contact**

■ oo-software.com
 Read more
 ■ tinyurl.com/Ln2wsua

System requirements

Windows XP/Vista/7/8

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



O&O DiskImage Professional 8 aims to take much of the effort out of backing up by handling both system and file backups.

At the top level, it will back up your entire system with a couple of key presses. If you use it for file backup, though, you'll probably want to define the folders it works with.

There's a good drive view to help with this, which shows the drives and partitions on your PC and offers a folder map. You can also look at the backup jobs you've defined and define new ones, and there's a tool view, too, breaking down the program's use by function.

Even with all these ways of working, navigating the program

isn't easy, until you realise that the main control screens are all reached from the Start menu in Windows 7. The program would be much easier to use if these options were available on a menu or icon bar. A Back button would also be useful.

Improved for version 8 is a wizard for creating new backup jobs and this takes you steadily through the what, when, where and how questions before either running the backup directly or being saved as a backup job for future use. You can save a log of the job once run, and these and the backup files themselves are named with the date and time of the backup, so are always unique.

Also new, it's now possible to trigger a job by connecting a device, such as a USB drive. Finally, you can create a virtual hard drive in one step rather than two, even if this is really not a mainstream feature

The program offers both system and file backups, so you can safeguard your complete Windows environment, as well as specific drives, partitions, folders or files.

It provides full and incremental backups; the incremental option just copies the changes to files since the previous one and can save a lot of drive space. However, with an incremental backup there's an increased chance of failure should a corruption in one file invalidate the

BACKUP UTILITY

Acronis True Image 2014 Premium

£40 inc VAT (1 PC)**Contact**■ acronis.com

Read more

■ tinyurl.com/n59wbjf**System requirements**

Windows XP/Vista/7/8

Probably the best-known of all the system and file backup software tools, Acronis True Image 2014 Premium is now also called Acronis PC Backup & Recovery. For consistency, though, we'll use the more recognisable name.

This is a comprehensive package for backup and recovery, with all the bells and whistles you could want, including the key addition for this year's product, online storage. Backing up essential data to a second hard drive is good, backing up to a local network server is better, but sending it offsite to a file server on the Internet is best, if you want to safeguard against catastrophes like flood and fire.

You get 5GB of storage with Acronis True Image 2014 Premium, which is enough to save documents and some photos as files, but not for a system backup. More is available on monthly- or yearly rental, up to 500GB, which is £80 per year.

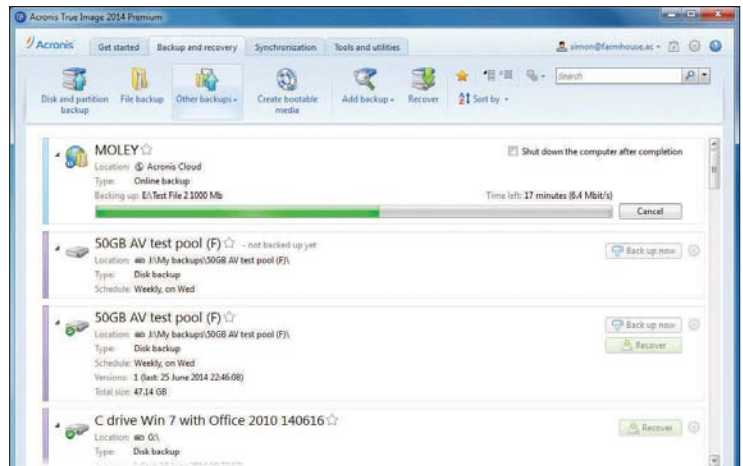
The speed of an online backup will vary with the speed of your broadband link, of course, but our test backup of 1GB of data, over a 10Mb/s link, took two minutes, 37 seconds to complete.

On more conventional, local backups, the program did well, completing a 50GB uncompressed backup to an eSATA hard drive in 20 minutes, with an archive

Usability: ★★★★★

Features: ★★★★★

Value: ★★★★★



The speed of an **ONLINE BACKUP** depends on the speed of your web link

size of 48.2GB. Using the built-in compression at its default setting, the lowest of three, it took 29 minutes, but the file size was only reduced by 1.1GB, to 47.1GB. It seems that the default compression on backup utilities is not that effective.

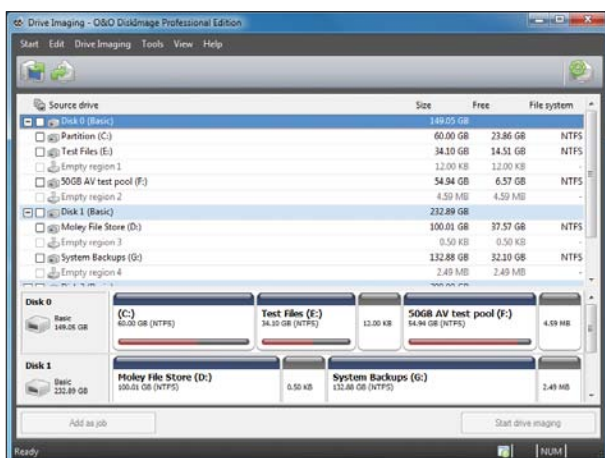
The interface is clean and easy to understand. At the top of the screen are four tabs and, where needed, there are ribbon-style icon bars below these. The four tabs are labelled Get started, Backup and recovery, Synchronisation, and Tools and utilities.

Get started offers three step-by-step help threads, for backing up, recovering and using Acronis Cloud storage. These are helpful, but it's a shame their not true wizards, setting up jobs as you follow them.

Backup and recovery is where most of the work is done, and each new job appears in a panel giving all its essentials, once you've used the disk and partition or file backup buttons to create one. Once defined, you can run a job again by selecting it, or apply a schedule to have it done automatically. The program can produce full, incremental and differential backups and includes good control of total backup files, based on number of archive copies or total storage space used.

Verdict

Acronis True Image is still the backup utility to beat and the 2014 Premium product adds online storage to its arsenal of data security utilities. **✗ Simon Williams**



DiskImage offers both **SYSTEM AND FILE** backups

whole backup. Many people prefer to take full backups each time, but to only keep the most recent two or three in the series, to save space. The program can be set to keep a specific number of backup copies.

Most backup software providers are keen to hook you in to online storage, so they can rent you space on their servers. This can be a very effective solution if you have fast, unlimited broadband, but O&O doesn't offer this yet.

As a test, we backed up the drive on our test PC containing just the 50GB of test files we use when reviewing internet-security software. We ran two backups, both uncompressed and with the default Microsoft LZNT 1 compression used by O&O DiskImage Professional 8. We were surprised by one set of results.

The uncompressed backup took 26 minutes and produced a backup

file of 48.3GB, both figures much as we expected. Running the same backup with compression, though, increased the processing time to one hour, three minutes, over twice as long, but only reduced the size of the file by 1GB, to 47.3GB.

Verdict

O&O DiskImage Professional 8 handles the basics of system and file backup well, though, it's not the easiest application to use, thanks to its unconventional design. We were surprised how long it took to save a compressed backup and a little disappointed at the size reduction offered by its default compression. **✗ Simon Williams**

PDF SCANNER

Not Another PDF Scanner 2

Free

Contact

■ sourceforge.net

Read more

■ tinyurl.com/p2afp9s

System requirements

Windows 8

Usability: ★★★★★

Features: ★★★★★

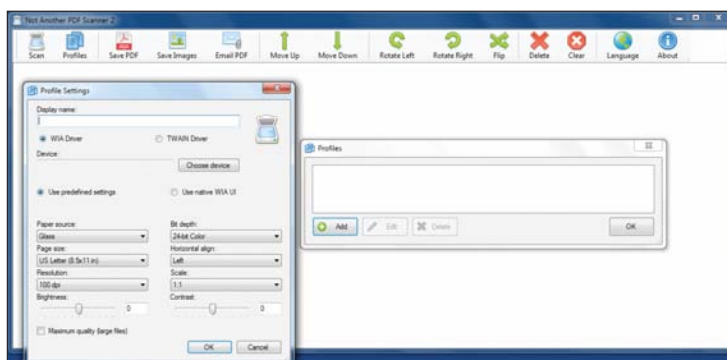


Windows has built-in support for scanning documents. In fact, it not only supports scanning but positively embraces the endeavour, forcing you to save your scanned documents where it thinks they should go, and to perform several extraneous steps every time you want to scan a page. If you find that annoying, you should try Not Another PDF Scanner 2 (NAPS 2).

The bare-bones interface is simple to use, and lets you set up multiple scanning profiles, each with its own name, resolution, document size, scan source, and so on.

When the time comes to scan, you just pick a profile and scan. The images scanned are imported into NAPS 2, and you can then save them as images or as PDFs.

The software supports several image formats, including JPEG, PNG and Tiff. PDF support is basic and straightforward: select a number of images and click the Save PDF button to produce a PDF that includes them, one per page.



NAPS 2 lets you **CREATE PROFILES**; for example, to scan in 24-bit colour

You can control the ordering of the pages via toolbar buttons, but you don't get to tune anything else about the PDF. It's as basic as it gets.

Profiles present many settings, but don't take them too seriously – they may not all work. Despite setting a Receipts profile to scan documents in greyscale, resulting images were in full colour.

The only feature we missed was image straightening. When scanning magazine pages, no matter how hard we tried to position the paper straight, it tended to deform as the scanner lid was closed. Many

other scanning applications let you partially rotate the scanned page to compensate for this, but NAPS 2 doesn't have this option. It does let you rotate the page 90 degrees right or left, but that's useful only if you incorrectly orient the page when putting it on the scanner.

Verdict

If you're looking to scan a few documents and like to make your own calls about how and where to save them, then NAPS 2 beats Windows 8's built-in scanning feature. **Erez Zukerman**

PDF MANAGER

ReadCube

Free

Contact

■ readcube.com

Read more

■ tinyurl.com/nzezjnv

System requirements

Windows XP/Vista/7;

Mac OS X 10.6 or later

Usability: ★★★★★

Features: ★★★★★

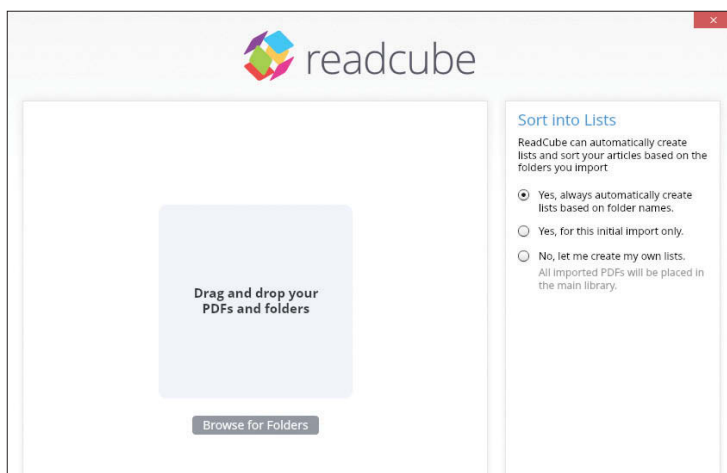


PDF library organisation is important for many people. Enter new kid on the block ReadCube, a free Adobe AIR app that's currently in public beta. It offers a comprehensive, all-in-one solution for organising, finding and reading articles.

Once ReadCube and AIR are both installed, you'll also need to create an account; then the only thing the app requires are PDFs.

You can import a PDF library with one click, after which the app immediately starts the resolving process, identifying the articles, authors, and papers. Your own meticulousness with articles comes into play here, as it easily recognises correctly named files, but sometimes struggles with messy file names.

The app automatically imports your folders, which are available to browse on the left sidebar. Also available here are search options, article recommendations, which are based on your current library, and open articles you are currently reading on ReadCube.



READCUBE can automatically produce lists based on imported folders.

ReadCube's reader includes annotations and comments, and turns all names and citations into links. It's a killer feature that eliminates the need for a standalone PDF reader.

Things gets even better with the Enhance PDF feature, which turns all citations and names into links, bringing related articles to your fingertips. A click on a citation will reveal the entire reference

on the right-hand sidebar, and another click will lead to the full text, on your computer or through an online search. Being an all-in-one solution, ReadCube includes a search feature, which utilises: Google Scholar and PubMed.

Verdict

ReadCube, with its many features, it's a timesaver for anyone who deals with PDFs. **Yaara Lancet**

GAME

Watch_Dogs

£34 inc VAT**Contact**■ ubi.com/uk**Read more**■ tinyurl.com/qj3x8ag**System requirements**

Windows Vista (SP2)/7 (SP1)/8 (all 64-bit only); Intel 2.66GHz Core 2 Quad Q8400 or 3GHz AMD Phenom II X4 940; 6GB RAM; DirectX 11 graphics card with 1GB video RAM; nVidia GeForce GTX 460 or AMD Radeon HD 5770; 25GB drive space; DirectX 9.0-compatible soundcard



The next generation is here, and it turns out that it's not too different to the previous generation. Finding itself the vanguard of PlayStation 4 and Xbox One hype a couple of years ago, hacking-themed open world action game Watch_Dogs perhaps set impossible expectations.

As it's the closest we're likely to get to GTA on next-gen for a little while, it's at least a welcome arrival even if it's a deflating one, too. Set in near-future Chicago, the game stars the surly, amoral charisma vacuum that is hacker/super-criminal/people's vigilante Aiden Pearce.

He's on a quest for vengeance after a job went wrong, taking a family member's life. Inevitably it all becomes embroiled in a wider conspiracy involving the sinister corporate forces who silently control the city and its ubiquitous surveillance systems.

It's extremely hard to like Aiden, while any concept of him being heroic is destroyed by his reprehensible behaviour between the game's 20-odd hours of storyline missions. Like the psychopaths in any GTA game, he mows down civilians by car or by gun in their hundreds, but his near-magical hacking abilities means he also gets to remotely empty their bank accounts, listen in on their phone conversations and get at-at-glance



summaries of their health issues, relationship woes and sexual peccadilloes both silly and sinister.

Other than cash and occasional leads to criminal hideouts, there's no purpose to this and even no commentary on why he does it - he just can, and given he spends half the game complaining about state surveillance and others' dark control of information, he's a massive hypocrite in a dorky baseball cap.

The hacking has a more active role in various quests, missions and getaway. At the touch of a button, cheerless Aiden can switch traffic lights from red to green in the hope of losing his pursuers in the resulting car pile-up, cause fuse boxes to explode and take out guards without revealing his presence, make bollards and tire spikes pop up from the road to neutralise a high-speed chase.

This stuff might be a million light years away from real-life hacking, but it's the best aspect of the game by far as it turns the city into one giant, playful trap.

You can simply play it like GTA instead, and try to lose or ram your pursuers during car chases, but the options to do things differently are there, and refreshing.

This is doubly true of the mission, which involves trying to sneak through an area and reach a particular objective or target without falling into an open firefight. There are some basic stealth controls, but what works best is hacking into security cameras to get a bird's-eye view of who's where and then have options to take them down without engaging directly.

An enemy's own grenade can be detonated on his belt or a steam pipe can explode in his face. There's great flexibility and freedom here, and if things do go to pot, then you can fall back on to reasonably robust shooting and car-jacking.

This is familiar, tried and tested stuff, which anyone who's played a GTA game will feel instantly familiar with. Clearly there's excitement to having an open-world city to go nuts in with the improved graphics of next-gen (and high-end PCs), but Watch_Dogs does wind up feeling assembled from parts of other games and left struggling for an identity of its own. The hacking's entertaining, but ultimately a sideshow to car chases and shoot outs, and certainly failing to live up to the inventive promise of the game's early trailers.

More damningly, while the PS4/Xbox One/PC version of the game offers high resolutions and plenty of visual detail, the city and its population feel cold and robotic. Aside from a very small handful of gonzo side-missions, the game takes itself far too seriously and seems to have put a disproportionate amount of effort into cramming its map with icons denoting bitty, repetitive minigames over injecting some much-needed personality.

Verdict

If you can't wait for the inevitable PS4/Xbox One GTA V release, Watch_Dogs will scratch the itch. It's a real shame its hacking abilities, while fun, aren't much more than gimmicks, and that it feels so short on character, however. **Alec Meer**



GAME

Wolfenstein: The New Order

£34 inc VAT**Contact**■ bethsoft.com/en-gb**Read more**■ tinyurl.com/omroape**System requirements**

Windows 7/8; Intel Core i7 or equivalent AMD; 4GB RAM; nVidia GeForce 460, ATI Radeon HD 6850 or better; 50GB drive space

PC ADVISOR
RECOMMENDED



Umpteenth sequels to ancient first-person shooters aren't supposed to be any good. Especially when they stick to retro big dumb action values while playing it completely straight. Wolfenstein: The New Order is a game about shooting giant robot Nazis in the 1960s, for goodness' sakes, but it doesn't stop and laugh at itself even once. And it absolutely gets away with it.

It's a strange beast indeed, this one. On paper, almost everything it does is ridiculous - mechanical guard dogs, trips to the moon, secret Hebrew technology, escaping a concentration camp in a robo-suit, a hero who repeatedly walks away from fatal wounds, stopping to make coffee on a Nazi-occupied train...

The New Order could have gone for self-satire, as we've seen semi-successfully in 2013's Shadow Warrior and disastrously in the atrocious Duke Nukem Forever, but instead it twins its B-movie values with a reflective and sad plot.

Hero BJ Blazkowicz may be the same muscle-bound lunkhead who's been this series' star since 1992's Wolfenstein 3D (the granddaddy of shooters), but now he's scarred by loss, regret and the knowledge that he spent a decade and a half languishing in an asylum while the Nazis won World War II.

He's horrified by their atrocities, he's guilt-stricken by his failure to stop the mad scientist whose technology brought about that dark victory, and he's determined to protect those he cares about.

It's still shlock, inevitably, and the game wildly switches between a laser-focus on its supporting cast and ignoring them for ages



at a time, but somehow it all hangs together. It's an engrossing, expensive-feeling adventure - one that lasts about twice as long as your average contemporary FPS single-player campaign, and which boasts excellent action too.

It's got a big - but not too big - arsenal, and is careful to ensure every weapon retains a specific purpose throughout, plus it even offers a choice of approaches. The idea of stealth in a series which has always been about Arnie-style heroics is faintly absurd, but Wolfenstein pulls off silent stabbings, a simple (and optional) cover system and muffled pistol headshots rather well.

When skulking in the shadows goes wrong, the fallback is open and explosive gunplay, often in large and semi-open environments, so it's an impressively changeable experience.

A perks system also grants unlocks, mostly as a result of simply playing in the way you prefer, while a dark decision made in the earliest hours of the game opens

up or shuts off a few options. The New Order just about justifies a second playthrough for this reason, although you'll probably end up with most of the perks in a single campaign anyway.

Trying hard to justify its status as a single-player game, it also throws all it can at you in terms of settings and set-piece scenes.

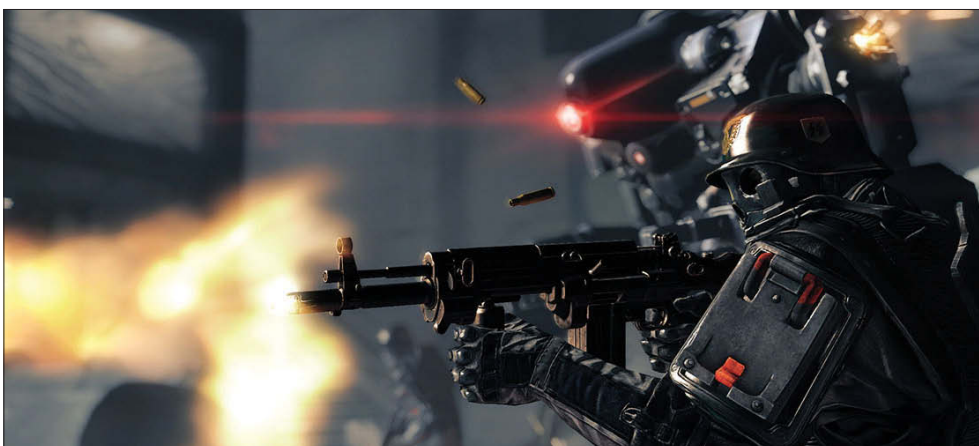
A few moments clunk, however, particularly when it tries to show a concentration camp as simultaneously horrific and silly sci-fi, while sometimes it forces stealth or assault on you whether you want it to or not. Be warned that it's also big on gruesome scenes of torture and mutilation, which sometimes drag its tone from comic book romp into jarring sadism.

Still, much as the tone spikes all over the place, this is a solid, substantial and satisfying shooter which carefully avoids so many of the follies of its peers - no following AI characters around, no backtracking, no infinitely respawning enemies, and just about avoiding a cut-scene overload.

It's perhaps churlish to claim that The New Order is far better than it has any right to be - after all, this is a series with serious heritage - but it's certainly a big and pleasant surprise to find that something so preposterous is so very well done.

Verdict

Big, silly and spectacular, The New Order might not be as era-defining as its hallowed predecessor, but it's without a doubt one of the best single-player first-person shooters of the year. **Alec Meer**



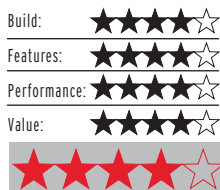
£290 ex VAT
£349 inc VAT

Contact

■ canon.co.uk
Read more
■ tinyurl.com/Ls7e2ax

Specification

A3+ inkjet photo printer; 128MB memory; 9600x2400dpi maximum resolution; 14.5ppm specified speed; 150 sheets plain paper maximum input capacity; 20 sheets photo paper; USB 2.0 interface; Wi-Fi 802.11 b/g/n; 590x331x159mm; 8.5kg



INKJET PRINTER

Canon Pixma iP8750

The Canon Pixma iP8750 is a no-nonsense, no frills machine that's focused on the job in hand, which is to make high-quality photos up to A3+ size. It manages this while remaining stylish in jet black, with a subtle weave pattern on the top surface. It's not heavy either at 8.5kg, and although necessarily broad at 590mm, the iP8750 is just 331mm deep and 159mm high.

Where you install it may need to be about double this depth as the fold-back cover becomes an extending paper support and the front cover drops down to reveal an expansive output tray. There are no top controls, just a cover that hides the ink tank that houses six individual cartridges - the regular cyan, yellow, magenta and black dye as well as a pigment black (for documents) and grey.

To the right of the output tray are the only three control buttons for Power, Stop/Restart and Wi-Fi syncing. In addition, a USB port round the back allows for direct PC



connection but ethernet is excluded. Printing is thus enabled for the usual trio of PC, tablet and phone, with support for Apple AirPrint and Google Cloud Print, plus Wireless PictBridge cameras. Wireless connecting was quick to establish, but thinking time before printing from both mobiles and PC could stretch to 20 seconds before action.

If you were thinking of capturing your photos on DVD, a separate disc tray can be slotted into the front and then hung rather precariously on the back of the printer when you're finished. It feels like an afterthought that was tagged on as a gimmick when the prime function was to produce gorgeous prints.

And there can be no denying that the prints on the Pixma iP8750

are indeed gorgeous. With print resolution up to 9600x2400dpi, the detail on both colour and mono (helped by the grey cartridge) images is exceptional. The pigment black also produces clear and bold documents, while colour documents maintain the brightness and contrast ratio of the originals.

In our tests, colour documents were averaged 10ppm, while black and white versions were slightly faster at 13ppm.

Verdict

Canon's Pixma iP8750 is the A3+ inkjet printer that serious photographers and illustrators have been waiting for - low on frills, easy to use and high on quality. **Martyn Clayden**

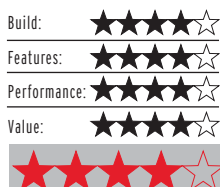
£743 ex VAT
£892 inc VAT

Contact

■ xerox.co.uk
Read more
■ tinyurl.com/mmb673b

Specification

Mono laser printer; 256MB standard memory; 1200x1200dpi max printing resolution; 62ppm specified speed; 650-sheet standard input capacity; 3750-sheet maximum input capacity; recommended duty cycle up to 275,000 images/month; 10/100/1000 BaseT Ethernet, USB 2.0, optional Wi-Fi; 476x541x420mm; 35kg



MONO LASER PRINTER

Xerox Phaser 4622

When buying a suitable printer for a small- to medium-sized business, the main priorities are often less about multiplicity of gadgets and funky designs and more about speed, capacity and reliability. It's with this in mind that Xerox came up with the Phaser 4622, a thoroughbred among affordable workhorses.

The basic unit is solid, measuring a squat 476x541x420mm and weighing 35kg. It comes with a fold-down 100-sheet multipurpose tray at the front and a 550-sheet paper feeder tray at the bottom, with a maximum output on top of the unit for a healthy 500 sheets at a time.

However, if you have a large number of employees demanding a lot of printing time or your daily volume is increasingly demanding, then you have the option to add a 500-sheet finisher with stapler on top, plus two further 550-sheet feeders and a high-capacity 2,000 sheet feeder (complete with stand) underneath the unit. This would

provide you with a whopping 3750-sheet capacity in all and you can even tack on a 4-bin mailbox.

Connectivity is via ethernet to your network or USB 2.0 to a single PC or Mac. If it's essential to have a wireless connection, then an extra Wireless 802.11n Network adaptor can be attached, which will also create native support for mobile/tablet printing with Apple AirPrint. A USB port at the front enables direct printing from a flash drive.

The control panel rests in front of the output tray and the buttons are kept to a minimum, with a Menu and Back button alongside arrows, a number pad and three final buttons for Help, Stop and Energy Saver.

The Phaser 4622 started churning out single-sided text documents at around 52ppm and duplex versions at 24ppm, courtesy of the dual-core ARM 600MHz processor using the standard 256MB memory. This can be expanded to 768MB (for £236) and for £362, you can attach a 320GB hard disk.



There are separate toner and drum cartridges that slot into their housings beneath the control panel and the supplied 13,000 page toner cartridge can be replaced by a more economic 30,000 page version - reducing costs from 1.37p per page to 0.94p per page. The print quality throughout is excellent - even large images have no obvious banding.

Verdict

Big on volume, swift on speed and high on quality, the Xerox Phaser 4622 is an obvious choice for small- to medium-sized businesses needing a dependable page churner. **Martyn Clayden**

£223 ex VAT
£268 inc VAT

Contact

■ lexmark.co.uk
Read more
■ tinyurl.com/mjg33uL

Specification

Colour laser printer; 2400x600dpi print resolution; quoted print speed B=30ppm C=30ppm; actual print speed B=23.1ppm C=13.6ppm; USB 2.0, 10/100 ethernet, Mobile access; 250 + 1-sheet manual feed; 256MB memory; 2.4in colour LCD display; USB drive support; auto duplex; 75,000 pages maximum monthly cycle; toner cost B= £71.06 C=£94.75 x3; print yield (pages) B=4000 C=3000; 291x442x407mm; 20.5kg; 1-year onsite warranty

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆



COLOUR LASER

Lexmark CS410dn

We see plenty of colour printers retailing for under £100, and a good many costing some £400 or £500. However, we haven't seen many recent models hitting the £250 to £300 price bracket. That, conveniently, is where this rather fine laser machine snugly nestles.

Lexmark used to be big in inkjets. Having pulled out of that market, it's now concentrating much of its fire on lasers, and the CS410dn is a very proficient example of its kind.

In typical laser style, it's not exactly small or light – although its 20kg weight is a far cry from the heavy-duty corporate models wedged into the corners of medium and large businesses. This model, in contrast, could happily fit on to a sturdy desk. The 2.4in LCD screen is in full colour, and tries not to overpower you with vast menus full of countless functions. If anything, the interface is a little terse and unwelcoming. But it's easy to navigate to the basics. And USB drive support makes it easy to run through a storage device and print off a picture without needing to touch a computer.

You can also hook up the CS410dn to mobile devices. The network port is a 10/100, while Wi-Fi is available only as an option.

The Lexmark can hold up to 250 sheets of paper as standard – a single-sheet manual feed is also available. Although 250 sheets isn't an amazing amount, and wouldn't allow the CS410dn to compete with many £350+ models, it's an adequate starting point for a printer that would be best suited to small- to medium-sized businesses.

It can be significantly upgraded, with two additional 550-sheet paper trays, plus a 100-sheet feeder all available. Having said that, if it's superior paper handling you want, you should probably be paying an extra £125 or so for the CS410dtn, as this comes with a standard capacity of 900 pages.

An ample 256MB of memory is included as standard, and this can be boosted to 2304MB, should your needs be particularly demanding.

Armed with its 800MHz dual-core processor, the Lexmark is a powerful beast. Its speed is good, even if it makes no attempt to



keep up with the models in the price bracket above.

At its fastest, we recorded speeds of 23.1 pages per minute (ppm) when generating black text. The lettering was a little faint here, though, and when we insisted on more toner being used, the speed fell to 21.1ppm. That's including the eight second start-up time, though, and this printer can produce around 26.9ppm once up and running. Over longer document, it'll get close to Lexmark's estimated 30ppm.

Print quality

Once extra toner is used, the CS410dn produces very capable text, with nicely-defined characters. The text isn't amazingly thick, but it looks very nice. There's an auto-duplex mode as well, and speed here drops to 12.8ppm – a sizeable fall, but one that the extremely cost-conscious may feel they can make do with. Auto duplexing is turned on as standard, so you may find yourself using it even without realising.

The Lexmark promises excellent colour matching, with Pantone calibration allowing for accurate shades. We liked its palette, and found its fuzzy greens and deep blues made an enchanting job of our graphics. Those who like their colours intense and lowering may feel the need to adjust those settings a little. Nonetheless, its light but crisp shades are very fine for a colour laser.

Speed is decent, too, turning out pages at the rate of 13.6ppm. That's nowhere near to the figures tossed out by good £400 models. But the Lexmark is a clear class above the sluggish inkjets and cheap sub-£150 colour lasers.

Price is a bit of a thorny issue with this printer. Lexmark quotes £289 inc VAT, and we've gone with Printerbase.co.uk's pricing of £268. However, at the time of writing, there were other reputable sellers offering it for under £150 – a huge discount. It's early days for the CS410dn, and we're inclined to ignore the low prices. However, watch this space, as it's possible this is a model that could become highly affordable very quickly.

That's unlikely to help its running costs, though, which are high. Almost 1.8p a page for mono text is relatively pricey for a laser, but 9.5p per page for colour is very painful – if not atypical for colour lasers.

Verdict

The running costs do hurt an otherwise very competent printer. The Lexmark CS410dn does everything well, without excelling for its price range. If you want a sturdy page churning that can also slip to high quality colour for the odd big splash, it will serve you well. Colour freaks may want to consider paying a little bit more upfront for a higher-priced model that can offer superior long-term running costs. **Robin Morris**

£650 ex VAT
£780 inc VAT

Contact

■ nec-display-solutions.com

Read more

■ tinyurl.com/q6j2n6w

Specification

DLP technology; 1280x800 native resolution; 3500 ANSI lumens brightness ratio; 10,000:1 specified contrast ratio; 33dB (39dB bright mode) noise; 2x D-Sub (1x input, 1x output); 2x HDMI; 1x RCA; USB; audio in/out; LAN; 278W max power consumption; 'up to 8000 hours' lamp life; 368x286x97mm; 3.6kg; 3-year warranty

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆



DLP PROJECTOR

NEC M352WS

Aimed at SMEs and schools, NEC's M352WS is a DLP model with an unconventional design. But we shouldn't underestimate the abilities of this very fine projector, and that short-throw lens can create a very large image in a very short space. A 100in (2.54m) image can be created at a distance of under a metre, for instance, and a picture half as large again can be produced at 1.5m.

Its specifications list an ample 3500 ANSI lumens to play with, a rating that makes it highly flexible. Slightly darkened rooms will always produce the best results, but it's possible to coax a clear image from this model even in daylight.

DLP technology isn't as bright as LCD, but the NEC still projects a good picture. A sophisticated ambient sensor can adjust the settings to suit the conditions. This worked well in our tests, and you won't need to fiddle with the controls every time the projector changes location.



The NEC has a LAN support, allowing it to be plugged into the network. Wireless LAN is an option.

The 1280x800 native resolution isn't very high by today's standards, although it's suitable for a business/education projector - home cinema enthusiasts will find other models better suited to their needs.

The built-in speakers are loud and clear. You'll want a meatier sound system for decent results, but for boardroom effects, they're fine.

DLP technology is famed for its strong colour depth compared to LCD, and this is very much in evidence on the M352WS, where moving images and stills are all rendered with remarkable colour.

The different shades are beautifully separated, and even

awkward skin tones are reproduced with clarity. For presentations and pictures, the NEC is an excellent model, and even small text is easily read. The short throw lens means that images can be truly spectacular, and this will be a great riposte to those who believe projectors produce only poky images.

The noise levels are not kind to your environment, though, and the projector puts out a loud 39dB at its brightest. Even in eco mode, it's specified with an uncomfortable 33dB. It's worth considering if you're planning to use it in a quiet location.

Verdict

The M352WS makes a spectacular impression, with its clear but vivid images. **Robin Morris**

£75 ex VAT
£90 inc VAT

Contact

■ canon.co.uk

Read more

■ tinyurl.com/n9Lxvn7

Specification

4800x1200dpi max print resolution; actual print speed B=9.7ppm C=3.8ppm; 1200x2400 dpi optical scanner; copier; Super G3 fax; USB 2.0, Wi-Fi 802.11b/g/n, Apple AirPrint, Google Cloud; LCD display; 100-sheet input; 30-sheet ADF; auto duplex; ink cost B=£16; C=£19; print yield (pages) B=600; C=400; 458x385x200mm; 8.5kg

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆



COLOUR INKJET MULTIFUNCTION DEVICE

Canon Pixma MX535

There were times with the MX535 when its many features threaten to overpower it, such as the number of trays and other features. However, Canon's tried-and-trusted design manages to keep everything on just about the right side.

The output tray protrudes above the main 100-sheet paper feeder in a slightly awkward layout that isn't improved by the flimsy nature of the output tray itself. This is partly due to the need to reserve the top half of the MFD for the powerful scanning/copying/faxing facilities.

The latter scanning ability is lent exceptional functionality through the capable 30-sheet ADF, while scanning output itself is strong, colourful, and accurate. Scan times were good, too, with lower-resolution A4 scans dropping out in a mere eight seconds, and 300dpi in just under 12. Even glorious 600dpi completed within 29 seconds.

The scanner lid itself is both robust and highly adjustable, making the MX535 a more versatile

multifunction device than the typical sub-£100 fodder.

The control panel is a buttons-and-LCD affair, with no nod towards touch-sensitive or graphic interfaces. But if the layout isn't the most pleasurable to use, it is at least logical.

Connectivity is well handled. The 802.11b/g/n interface makes for useful wireless printing, and you can add Bluetooth facilities, too. Google Cloud and Apple AirPrint are supported, and you can tap into Android and iOS mobile devices.

At first glance, the MX535 seemed a little slow. After all, its draft mode finished a 10-page bundle at a rate of just 9.7 pages per minute. However, the standard mode has improved print quality, yet still achieved a time of 8.6ppm.

When it comes to colour graphics, the 2.8ppm standard mode time remains practical, and not too far off the 3.8ppm of the draft mode.



Canon's print quality is generally among the best and, particularly in standard mode, the MX535's output offers superb clarity of text, and ravishing colour carved out with sharp and clean lines.

The MX535's print costs are standard, though, and 2.7p and 4.8p for mono and colour respectively (with high-capacity refills) are solid figures.

Verdict

Canon's MFDs are ever-reliable, and the MX535 is a device that aims at excellence in all of its facilities, rather than concentrating on the printing. **Robin Morris**

GAMING LAPTOPS

Sales of desktop PCs have fallen significantly in the past couple of years, however, one segment of the PC industry that's still doing well is the market for gaming laptops.

Cliff Joseph tests six of the best

Despite competition from next-generation games consoles and mobile gaming in iPads and the like, the sales of dedicated gaming laptops have increased by 50 percent since 2011, according to the graphics gurus at nVidia. And, of course nVidia has a lot to do with that success, as its GeForce range of graphics cards almost completely dominates the gaming industry, dazzling users with super-fast framerates and ever more spectacular 3D eye-candy.

And nVidia's domination looks set to continue with the arrival of its latest generation of graphics cards for laptops, the GeForce GTX 800M series. These new GPUs are faster than ever - that's only to be expected - but this improved performance means that prices of gaming laptops have finally begun to drop quite significantly.

High-end laptops with true gaming potential we've reviewed in the past typically costed £1,500 to £2,000. And you can certainly still spend that sort of money on a top-of-the-range gaming rig. However, as we discovered, the enhanced performance of the 800M series GPUs means it's possible to get respectable gaming performance from more mid-range machines in the £1,000 to £1,500 category. In fact, Chillblast's Defiant 2 and Scan's 3XS

Graphite even manage to come in under £900, yet still maintain great gaming credentials thanks to the strong performance of a mid-range GTX 860M graphics card.

The new 800M series bring another shift in emphasis, too. Like Intel's Haswell-generation chips - the fourth generation of the Intel Core series - they are now starting to focus more on energy-efficiency and portability. Gaming laptops have traditionally been big, heavy and noisy, with large air vents and cooling systems required to cope with the heat output of their powerful GPUs. And, of course, the power requirements of these GPUs meant that battery life was always pretty poor.

Many gaming laptops still follow that pattern, especially the 17in monsters. However, better power efficiency means it's possible to cram some serious gaming potential into smaller, lighter designs. We're seeing more 13- and 15in gaming laptops that are small enough to fit into a backpack without giving yourself a hernia. The Chillblast Defiant 2 fits easily into a bag, while the 15in P35W v2 from Gigabyte is an Ultrabook-esque 20.9mm thick. This means that there's now greater choice in the gaming market than ever before, so read our reviews to see which laptop is right for you.



Photography by Dominik Tomaszewski



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

ALIENWARE 17

£1,699 inc VAT • alienware.co.uk • tinyurl.com/q6dud64

This latest version of the Alienware 17 isn't radically different from its predecessors (tinyurl.com/ks5LnfX), but it adds a new GeForce GTX 880M graphics card that provides high-end gaming performance at a more competitive price than we've seen before.

The design is essentially unchanged – it's built like a tank, measuring a full 48.5mm thick and weighing 4.2kg. And like all Alienware laptops, it's bedecked with customisable coloured lights that smoulder from beneath the keyboard, trackpad and various other sections of the matt-black chassis.

One advantage of the laptop's size is that there's plenty of space to include useful stuff. There's a built-in DVD drive along with gigabit ethernet, four USB 3.0 ports, an HDMI port that provides both input and output options, and Mini DisplayPort.

Battery life isn't outstanding, but switching to integrated graphics did allow the Alienware 17 to manage four hours, 20 minutes of streaming video from BBC iPlayer. That's not bad for such a powerful machine, and should allow you to watch a few episodes of *Game of Thrones* before you need to charge it up again.

The 17.3in screen is as attractive as ever, with 1920x1080 resolution and a bright, colourful image that provides excellent all-round viewing angles. The speakers sound a little tinny at higher frequencies, but they produce a full sound, with enough volume to handle explosions in games and films.

That combination produced a score of 5600 points when running the general-purpose PCMark 7 tests; and 3100 points and 3300 points respectively in the Home and Work suites in PCMark 8.

Those are strong scores, although a dedicated solid-state drive would enhance performance even further here. However, we couldn't fault the GeForce GTX 880M when it comes to gaming performance.

Running *Tomb Raider 2013* on its default setting – 1920x1080 with Normal quality – produced a strong 60.1fps, and this barely wavered when we stepped up to High. Cranking the settings up to Ultimate did have more of an effect, dropping to 46fps, but that's still strong enough to satisfy even hard-core gamers.

VERDICT: The Alienware 17 isn't perfect – a laptop costing this much ought to include an SSD. However, it provides top-of-the-range performance that would previously have cost you £2,000 or more.



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

ASUS G750JZ

£1,769 inc VAT • asus.com/uk • tinyurl.com/o8agboL

The G750JZ makes a good impression right from the start. The 17in machine may be big and bulky, weighing in at a hefty 4.5kg and measuring a mighty 58mm thick, but the build quality is excellent. The matt-black chassis has an attractive 'soft-touch' finish, while the keyboard has a nice, firm feel to it.

It's based around a quad-core Haswell-generation Intel Core i7 running at 2.4GHz, backed up by a top-of-the-range nVidia GeForce GTX 880M with 4GB video memory. There's a healthy 16GB of system memory, and the G750JZ boots from a 256GB SSD, with a conventional 1TB hard drive included to store games, music and videos. There's also a Blu-ray drive for HD films, a 2.1 speaker system, and a Thunderbolt interface for high-speed backup drives.

The SSD wasn't quite as speedy as we might have hoped, though, letting the laptop fall almost 100 points short of the 6000-point level that we'd anticipated for our general-purpose PCMark 7 tests.

There was no problem with gaming performance, either. *Stalker: Call Of Pripyat* was quickly dismissed with an average framerate of 135fps, even at its maximum resolution and with Ultra graphics settings. *Tomb Raider* produced a consistent 60fps on both its Normal and High settings at 1920x1080 resolution, and still maintained a strong 47.7fps even when we stepped up to its Ultimate setting.

Scores like that put the G750JZ among the most powerful gaming laptops we've seen so far. It even managed something close to respectable battery life, lasting for four hours, 30 minutes of streaming video when using integrated graphics.

We do have a couple of small complaints, though. The 17.3in screen has 1920x1080 resolution, and the image quality is enhanced by its anti-glare matt finish. But while the horizontal viewing angles are very good, the vertical viewing scope is more limited, and we did find ourselves needing to nudge the screen to improve visibility. And, despite its decent volume, the stereo speaker system sounded annoyingly tinny at times. Those aren't fatal flaws by any means, but they do stand out on an otherwise impressive piece of gaming kit.

VERDICT: You can find similar performance at a lower price, but features such as its Blu-ray drive, 2.1 speakers, and Thunderbolt interface mean that the G750JZ is well-equipped for other types of entertainment, as well as demanding tasks such as video editing.



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

PC ADVISOR
RECOMMENDED

CHILLBLAST DEFIANT 2 MINI

£899 inc VAT • chillblast.com • tinyurl.com/nndfzrr

Like its predecessor (tinyurl.com/pbzpa65), the Defiant 2 puts strong gaming performance into a highly portable design. It's a little chunky, measuring about 32mm thick, but a weight of 2.1kg means that it's still light enough to carry around in a backpack.

This model improves battery life, as switching to integrated graphics gave us five hours, 33 minutes of streaming video, so it's better suited to life on the move than many gaming laptops.

We were pleased to see another improvement, in the form of an IPS display with full-HD resolution. It provides a bright image with almost luridly bold colours and excellent all-round viewing angles. It's a shame, though, that the speakers are feeble - barely audible even at maximum volume when listening to the news on BBC iPlayer.

More important for gamers, though, should be the step up to a new nVidia GeForce GTX 860M graphics card, replacing a GTX 765M. There's a minor CPU speed bump for the fourth-generation Haswell Core i7 processor, stepping up gently from 2.4- to 2.5GHz, while the 8GB of memory and 1TB hybrid hard drive remain unchanged from last year's model. That hybrid drive can't match the performance of a solid-state drive, which means that the Defiant's score with the general-purpose PCMark 7 test is a mid-range 4456 points. For some reason it refused to run the Home and Work tests in PCMark 8.

However, its GTX 860M graphics card more than lived up to expectations for gaming performance. The 860M may not be top-of-the-range, but in many of our gaming tests it still managed to rival the 880M GPU found in some of its more expensive rivals.

In fact, with Batman and Tomb Raider on their default settings, the Defiant produced framerates of 53- and 60fps, that were almost identical to more expensive laptops equipped with the 880M. The same was true when raising graphics settings on both games to High, and it was only when we took the final step to maximum settings with those games that the Defiant slowed down a little.

VERDICT: It's a shame that you don't have the option of specifying the graphics card in the Defiant 2, but it's hard to argue when this sturdy little laptop provides such strong performance for just £899. And, unlike most gaming laptops, it's small and light enough to carry around in a backpack, making it a great choice if you need a powerful laptop that can also cope with life on the go.



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

PC ADVISOR
BEST BUY

GIGABYTE P35W V2-CF2

£1,399 inc VAT • uk.gigabyte.com • tinyurl.com/o9wuf8s

The Gigabyte P35W v2-CF2 may have a clumsy and unwieldy name, but at just 20.9mm thick it's the slimmest, most elegant gaming laptop we've ever tested. We found it weighed 2.5kg, though, rather than the 2.16kg listed on Gigabyte's website. Battery life isn't great, at just four hours of streaming video when using integrated graphics, but that should let you watch a couple of films on a plane.

There's a lot of power crammed into that slim unit, too. It includes a quad-core Intel Core i7 running at 2.5GHz, along with 16GB of memory, and an nVidia GeForce GTX 870M on graphics duty. The storage system is a little unusual, as the boot drive consists of a pair of 128GB SSDs arranged in a striped RAID 0 configuration, joined by a conventional 1TB hard drive for extra storage. That setup delivered excellent performance, with a PCMark 7 score of 6226 points that ranks among the highest we've ever seen. That score is particularly impressive given Gigabyte's £1,399 price tag.

To keep in budget, the GTX 870M graphics processor is not the best available, but it does come close to matching the performance of the GTX 880M used in some more expensive rivals. When running Tomb Raider and Batman: Arkham City at their default settings, the P35W v2 achieved framerates of 60- and 56fps respectively - matching the 880M cards that we've seen elsewhere.

That performance held up with both games on High graphics settings, and it was only when we took the final step to the very top settings that the 870M slowed a little. Tomb Raider in Ultimate detail produced an average framerate of 40fps - about seven frames slower than the 880M - while Maximum Batman came in at 42fps, which was just four frames slower than the 880M. The laptops we've seen with the 880M tend to be around £300 more expensive, so the P35W v2 certainly provides excellent value for money.

Our only complaint concerns the display - the 15.6in display is darker than we might have liked. And the limited brightness doesn't help the limited viewing angles. A laptop costing £1,399 deserves more than a budget screen.

VERDICT: It's impressive to see a gaming laptop as slim and as light as this, especially one that provides such strong graphics performance. The poor screen has room for improvement, but the P35W v2-CF2 provides high-end gaming performance at a more accessible price.



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

PC ADVISOR
RECOMMENDED

SCAN 3XS GRAPHITE LG156

£899 inc VAT • scan.co.uk • tinyurl.com/mytg9x5

It's starting to look as though the real star of nVidia's new GTX 800M series is the mid-range 860M graphics processor. It enables laptops, such as Scan's 3XS LG156, to provide strong gaming performance at more competitive prices than ever before.

It isn't terribly exciting to look at. Its dark grey 15.6in casing is decidedly generic, and lacks the glowing lights and go-faster stripes of gaming rivals such as Alienware and Asus. Compared to some, it's not so heavy, weighing in under 3kg, but at a still uncomfortable 2.7kg and 42.7mm thick. The build quality is good, and we liked the firm feel and travel of the keyboard. The trackpad's a bit small, but gamers will often use it with a mouse, so that's not a major issue.

The 15.6in screen provides 1920x1080 resolution and is bright and colourful. Its viewing angles aren't what you'd find from an IPS display but we've seen worse on laptops costing more than this.

The speakers have a bit of a metallic edge to their sound, but they're reasonably loud and adequate for playing games or music without needing external speakers. Scan also includes some useful bonuses, such as up-to-date 802.11ac wireless for high-speed Wi-Fi, and an S/PDIF interface for digital audio output.

It's good value for money too, costing just £899 with a Haswell-generation Intel Core i7 running at 2.5GHz, 8GB of Corsair Vengeance gaming RAM, 1TB hybrid drive; and of course, the GTX 860M for graphics. That hybrid drive isn't ideal, but it's an acceptable compromise to keep price down. The Graphite's score of 4846 points in PCMark 7 is about as good as you'll get without a dedicated SSD.

The mid-range GeForce GTX 860M graphics processor also provides very good gaming performance. As we've seen before, the GTX 860M can hold its own against top-of-the-range rivals when running games such as Batman: Arkham City and Tomb Raider at their default settings, and also when we step up to High settings on both games. It's only when you push Batman to his Maximum that the GTX 860M slows down a little to 38fps, while Tomb Raider's Ultimate setting dips to a smidgen under 30fps.

VERDICT: The design of the 3XS Graphite isn't anything to write home about, and at 2.7kg it's probably not going to leave home very often either. However, it's good value and provides the sort of gaming performance that not so long ago would have cost £1,200.



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

SCHENKER XMG P504

£1,544 inc VAT • mysn.co.uk • tinyurl.com/qh3wmkq

The XMG P504 certainly isn't going to win any awards for elegant design. The generic black-plastic casing is sturdy, but it's chunky and heavy, measuring a full 45mm thick and weighing 3.5kg.

The keyboard feels firm and comfortable, but its layout includes a half-height US-style Enter key and puts the Fn key over on the right of the spacebar – both of which took some getting used to.

But if good looks aren't a strong point, then the P504 does come up trumps on performance. Prices start at around £1,100 with a Core i5 processor, though, we reviewed a top-of-the-range model that costs £1,544 with a Core i7 running at 2.4GHz, 8GB memory and nVidia GeForce GTX 880M with 8GB of video memory. Windows boots from a 240GB solid-state drive and a secondary 750GB hard disk.

That setup worked well, allowing the P504 to just edge pass the 6000-point mark when running the general-purpose PCMark 7 tests, and we saw similarly strong scores in PCMark 8.

The GTX 880M proved consistent in our gaming tests, and the P504 produced scores virtually identical to other laptops using the 880M in conjunction with the Intel Core i7 processor. It breezed through Stalker for casual gaming, and hit a smooth 60fps on Tomb Raider's default settings at 1920x1080 resolution. There was a drop to 46.6fps when Tomb Raider is set to Ultimate graphics, but that's the case with all the 880M-based gaming laptops we've seen so far.

The P504 has other flaws, though. Battery life is poor even by the standards of gaming laptops, giving us just three hours of streaming video when using integrated graphics. That was a weakness in last year's P503 model as well (tinyurl.com/L5yxxva).

The P504 also seems to use the same screen as its predecessor. Its matt finish and 1920x1080 resolution provided good image quality, with wide horizontal viewing angles so we could sway in the heat of battle during gaming sessions. But the vertical viewing window is limited and the image darkens quickly when you tip the screen back.

The 2.1 speaker system also sounds tinny, although it did provide a fair amount of volume, so we could play games or music without needing to plug in external speakers.

VERDICT: The P504 is big and heavy, and combined with the poor battery life it's essentially confined to indoor activities. But what it lacks in elegance it makes up for in performance.

FOR EVERYTHING ANDROID



**DIGITAL
EDITION ON
ANDROID
& iOS**

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Every issue is packed with the latest reviews, features, tutorials & more.


Conclusion

Our key conclusion after testing all these gaming laptops is that nVidia's latest range of GPUs really does provide strong gaming performance at more competitive prices than ever before.

There are two laptops from Chillblast and Scan that use the mid-range GTX 860M and are capable of providing playable frame rates for games such as Tomb Raider, even when they are set to their highest graphics settings. Yet both laptops are priced at a competitive £899. The 13.3in screen of the Chillblast Defiant 2 Mini means it's the more portable of the two, but the 15.6in 3XS Graphite from Scan has a better sound system and a built-in DVD drive.

At the other extreme are the 17in gaming monsters from Alienware and Asus. These are old-school gaming laptops -

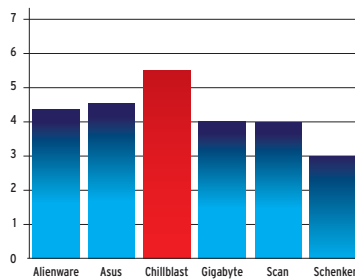
expensive, and so big and heavy they'll probably never leave home. Their gaming performance is, however, exceptional and their large screens are ideal for gaming and other forms of entertainment.

But, sitting right in the middle of this group is Gigabyte's P35W v2-CF2. The GTX 870M chosen by Gigabyte isn't quite top-of-the-range, but its performance will satisfy all but the most hard-core gamers, while also allowing Gigabyte to slim this 15.6in laptop down to just 20.9mm thick and a weight of 2.5kg. It's not quite in Ultrabook territory, but the P35W v2-CF2 manages to provide excellent performance in a genuinely portable design. The finishing touch is a price of £1,399 that represents real value for money and earns it our Best Buy for gaming laptops this summer. 

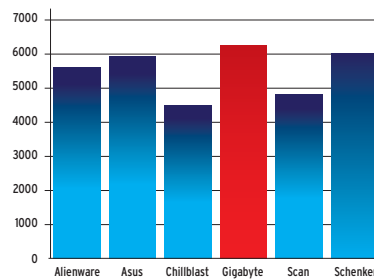
	ALIENWARE £1,699 inc VAT (£1,415 ex VAT) 	ASUS £1,769 inc VAT (£1,474 ex VAT) 	CHILLBLAST £899 inc VAT (£749 ex VAT)  PC ADVISOR RECOMMENDED
Model	Alienware 17	G750JZ	Defiant 2 Mini
Display	17.3in (1920x1080, 127ppi) anti-glare LCD	17.3in (1920x1080, 127ppi) anti-glare LCD	13.3in (1920x1080, 165ppi) IPS
Operating system	Windows 8.1 (64-bit)	Windows 8.1 (64-bit)	Windows 8.1 (64-bit)
Processor	2.4GHz Intel Core i7-4700MQ (3.4GHz Turbo)	2.4GHz Intel Core i7-4700HQ (3.4GHz Turbo)	2.5GHz Intel Core i7-4710MQ (3.5GHz Turbo)
Graphics	Intel HD 4600 (integrated)/GeForce GTX 880M (8GB)	Intel HD 4600 (integrated)/GeForce GTX 880M (4GB)	Intel HD 4600 (integrated)/GeForce GTX 860M (2GB)
Storage	1TB HDD (5400rpm), 80GB SSD	1TB HDD (5400rpm), 256GB SSD	1TB SSHD (5400rpm)
Memory	8GB DDR3L	16GB DDR3	8GB DDR3
Ethernet	Gigabit ethernet	Gigabit ethernet	Gigabit ethernet
Optical drive	DVD ± RW	Blu-ray reader	N/A
Video out	HDMI 1.4, DisplayPort 1.2	HDMI 1.4, VGA	HDMI 1.4, VGA
Wi-Fi	802.11a/b/g/n	802.11a/g/n	802.11a/b/g/n
Bluetooth	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0
Webcam	720p	720p	1080p
Speakers	Stereo	2.1	Stereo
Audio in	Built-in mic, 3.5mm line-in	Built-in mic, 3.5mm line-in	Built-in mic, 3.5mm line-in
Audio out	Headphone, line-out	Headphone/SP-DIF	Headphone
USB	4x USB 3.0	4x USB 3.0	3x USB 3.0, 1x USB 2.0
Other ports	Kensington lock slot	Thunderbolt, Kensington lock slot	Kensington lock slot
Card slot	SDXC	SDXC	SDXC
Trackpad	100x55mm, two-button	115x65mm, two-button	85x45mm, two-button
Other software	N/A	N/A	N/A
Power adaptor	240W mains adaptor	230W mains adaptor	120W mains adaptor
Battery	86Wh lithium-ion, non-removable	88Wh lithium-ion, removable	62.16Wh lithium-ion, removable
Dimensions	413.5x299x48.5mm	410x318x58mm	330x227x32mm
Weight	4.2kg	4.5kg	2.1kg
PERFORMANCE			
Battery/iPlayer	4 hours, 20 minutes	4 hours, 32 minutes	5 hours, 33 minutes
PCMark 7	5600	5929	4456
PCMark 8 home	3100	3200	N/A
PCMark 8 work	3300	3380	N/A
Games score ¹ (fps)	189/135, 55/46, 60.1/46	182/135, 55/46, 60/47.7	180/100, 53/41, 60/30

¹Games tested: Stalker: Call of Pripyat, 720p/1080p; Batman: Arkham City, 900p/1080p; Tomb Raider 2013, default/1080p

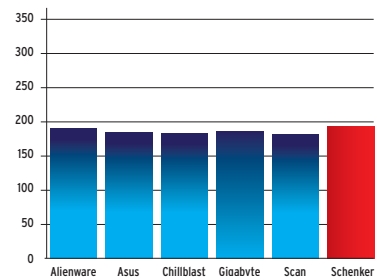
Battery life (hours)



PCMark 7 score (points)



Stalker, 720p (fps)



GIGABYTE

£1,399 inc VAT (£1,165 ex VAT)



PC ADVISOR
BEST BUY

P35W v2-CF2

15.6in (1920x1080, 141ppi) anti-glare LCD

Windows 8.1 (64-bit)

2.5GHz Intel Core i7-4710HQ (3.5GHz Turbo)

Intel HD 4600 (integrated)/GeForce GTX 870M (6GB)

1TB HD (7200rpm), 2x 128GB SSD

16GB DDR3L

Gigabit ethernet

N/A

HDMI 1.4, mini-DisplayPort 1.2, VGA

802.11a/b/g/n

Bluetooth 4.0

720p

Stereo

Built-in mic, 3.5mm line-in

Headphone

2x USB 3.0, 2x USB 2.0

Kensington lock slot

SDXC

105x60mm, two-button

N/A

180W mains adaptor

75.8Wh lithium-polymer, non-removable

385x270x20.9mm

2.5kg

4 hours

6226

3223

3400

185/122, 56/42, 60/40

SCAN

£899 inc VAT (£749 ex VAT)



PC ADVISOR
RECOMMENDED

3XS Graphite LG156

15.6in (1920x1080, 141ppi) anti-glare LCD

Windows 8.1 (64-bit)

2.5GHz Intel Core i7-4710MQ (3.5GHz Turbo)

Intel HD 4600 (integrated)/GeForce GTX 860M (2GB)

1TB SSHD (5400rpm)

8GB DDR3

Gigabit ethernet

DVD ± RW

HDMI 1.4, VGA

801.11ac/a/b/g/n

Bluetooth 4.0

1080p

Stereo

Built-in mic, 3.5mm line-in

Headphone, SP-DIF

2x USB 3.0, 1x USB 3.0/eSATA, 1x USB 2.0

Kensington lock slot

SDXC

90x45mm, two-button, finger-print reader

Watch Dogs

120W mains adaptor

77Wh lithium-ion, removable

374x250x42.7mm

2.7kg

4 hours

4846

3000

3232

178/102, 53/38, 60/29.4

SCHENKER

£1,544 inc VAT (£1,286 ex VAT)



XMG P504

15.6in (1920x1080, 141ppi) anti-glare LCD

Windows 8.1 (64-bit)

2.4GHz Intel Core i7-4700MQ (3.4GHz Turbo)

Intel HD 4600 (integrated)/GeForce GTX 880M (8GB)

750GB HD (7200rpm), 240GB SSD

8GB DDR3

Gigabit ethernet

DVD ± RW

HDMI 1.4, DisplayPort 1.2, mini-DisplayPort 1.2

802.11a/b/g/n

Bluetooth 4.0

1080p

2.1

Built-in mic, microphone-in, 3.5mm line-in

Headphone, SP-DIF

2x USB 3.0, 1x USB 3.0/eSATA, 1x USB 2.0

FireWire, Kensington lock slot

SDXC

100x57mm, two-button, finger-print reader

N/A

180W mains adaptor

77Wh lithium-ion, removable

375x268x45mm

3.5kg

3 hours

6020

3100

3315

192/143, 55/46, 60/46.6

ANDROID SMARTPHONES

With so many models on the market, finding a smartphone that's right for you can seem daunting. We round up the latest Android smartphones, with handsets to suit every pocket

The mobile phone industry has been turned on its head in the past seven years, with practically every phone now sold a 'smart' one with manifold mobile-computer possibilities. And for most people who can't, or won't, buy an iPhone, the default choice is now thoroughly Android. The combined weight of Google with its Android software and all its hardware licensees, such as HTC, Sony and Samsung, has created a buoyant and incredibly competitive market among handset manufacturers.

We've identified two main categories of such phones – the flagship devices that have been developed to catch up with the Apple iPhone, some listing more impressive-looking specifications now than Apple's latest models. And then there's the larger mass of more affordable options, typically priced around £100-£230 when sold SIM-free.

In the UK, many Android smartphones will be sold on contract, of course, often with no upfront cost, but on a two-year contract. Another option may be a pay-as-you-go (PAYG) handset that requires topping up with credit for calls and data. But bear in mind that PAYG phones may be locked to the selling operator, which will try to recoup its loss-leading sale price with costlier fees.

What to look for in a premium Android phone

The flagship Android smartphones of 2014 now all come with quad-core processors, huge 5in and larger touchscreen displays and 2GB or more of memory. They are also 4G-capable and ready

to join the UK's emerging LTE networks, and most now sport dual-band Wi-Fi with draft 11ac, so can take advantage of faster data links to the latest wireless routers.

The arms race for more processor cores and higher clock speeds was started by Android hardware makers, desperate to differentiate themselves with specifications against rival Android licensees and the iPhone. How much current models need all that power is a moot point; the move to more chip power was seen as a way to overcome some of Android's interface drag. With Google pedaling hard to speed up its software, interface stickiness is now barely a problem on the best Android hardware. The main processor will be integrated as a system-on-a-chip with the graphics processor, and all the best Android phones on test can play action games fluidly enough for most users.

Although benchmark speed tests tell us little about the suitability of a smartphone to serve in its chosen role as our personal internet gateway and digital assistant, we've included some of our lab results so you can see how the different handsets measure up against each other. We don't recommend you make your purchasing decision on these alone, though.

With development of the modern smartphone now slowing, manufacturers are building on existing components, notably the camera. Nokia made great strides with ultra-high pixel photography with the Lumia 1020 phone (tinyurl.com/Lponv3j) and its 41MP camera, although as a sub-brand of Microsoft, its handset runs



Photography by Dominik Tomaszewski

Windows Phone software. LG differentiated its flagship phone with a pseudo-Lytro focus-free camera, while Sony has made strides with a combination of 20-plus megapixels and high-quality sensors.

On the video side, we're seeing 4K-class UHD video recording, high-speed shooting for slow-motion playback, and front Skype cameras equally at home with full-HD face capture.

Other features typically only found in the leading Android devices include NFC, even if it remains a novelty for the greater majority of users, and infrared transmitters that allow your phone to replace your TV channel zapper.

What to look for in a budget Android phone

Typically, the budget end of the market includes phones that try to look as impressive as possible, while built down to a low price using older or slower components, and with plastic shells and buttons.

With Google keen to get revenue-earning Android phones into as many hands as possible, subsidised handsets have appeared that

make usable smartphones more accessible than we ever. Decent-spec phones such as the Google Nexus 4 (tinyurl.com/d7htpfj) enabled handsets with all the headline features of an iPhone to be brought into reach for under £200.

All of our budget selection is £230 or less; indeed, some can be found for under £100. Sacrifices included lower-quality displays, both in pixel count, which makes text blurrier, and also in colour/image quality. Processors will be slower or less efficient, meaning more interface lag is likely and perceptibly slowed screen animations.

Cameras may cite as many pixels as their more expensive stablemates, but will use low-grade sensors and cheaper optics, giving lower-quality photos. And built-in storage can be limited to a paltry 4GB, which means you'll depend on slow and fiddly SD cards just to keep your music collection to hand.

But if you can work through such limitations and don't have the budget for the full smartphone experience, some of the handsets on test are very tempting without breaking the bank.

BUDGET MODELS



PC ADVISOR
RECOMMENDED

EE KESTREL

£109 inc VAT • ee.co.uk • tinyurl.com/kf2Lccw

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

EE's Kestrel is currently the UK's cheapest 4G smartphone - available for £109 on PAYG (including a £10 top-up), or free on a £14 per month contract with 500MB of data, 500 minutes and unlimited texts.

Built by Huawei, the Kestrel uses the same rectangular grey-slab plastic chassis as its Ascend G6 (tinyurl.com/qgtfpdm). It feels lightweight at 145g, and at 133x65x7.85mm is comfortable, if plasticky, in the hand. The front and rear have a matt finish that makes it feel less cheap, but a band running around the circumference has that giveaway plastic sheen. It's not particularly sturdy, either; it creaks in the hand and rattles when you place it down.

On the Kestrel's right side are standard Android issue volume rocker and power buttons, and below the screen are Back, Home and Menu soft buttons. Less standard is a Micro-USB port on the top, while the headphone socket is located underneath, all a bit back to front. Besides the rear EE logo is a small speaker and 5Mp camera with flash. The back cover is removable, allowing you to access the microSD and micro-SIM card slots.

This cameras are basic, but do the job. There's a 1Mp snapper on the front, and a 5Mp offering with flash on the rear. You can't ask for more at this price, though, we found the colours in images were dull and saw a lot of unwanted noise.

The handset's saving grace is its screen. It's large at 4.5in, very bright, and its 540x960 resolution is decent compared with many budget phones. Viewing angles are good, too.

As we've seen before from Huawei phones, the Kestrel has hardware specifications you might expect to find in a more expensive smartphone. Inside is a 1.2GHz Qualcomm Snapdragon 400 quad-core processor, with 1GB of memory and 8GB (5.3GB usable) storage. EE specifies 12 hours' talk time and up to 370 hours standby; expect the Kestrel to last one day's use.

One reason you'd choose the Kestrel over other budget phones is its 4G connectivity. Motorola has also added 4G to the 2014 edition of its Moto G (page 75), but that phone costs an extra £50 (and £50 is a lot of money when you're talking about a £109 phone). EE also offers what it calls 'Double-speed 4G', with 20Mb/s downloads and 11Mb/s uploads. 4G isn't available all over the country, however, so if you don't frequent larger cities, it may be of little use today. You'll also need decent EE coverage in your area: the Kestrel is SIM-locked to its network. Don't expect NFC or the latest 11ac Wi-Fi at this price.

The Kestrel runs Android 4.3 Jelly Bean. It's not the latest version of Google's operating system, but it's stable, and EE says an update to 4.4 is being considered. Over this is the divisive Emotion UI interface. There isn't an Apps menu; instead icons for everything placed on the Kestrel's multiple home screens - some loose, others grouped into folders, all locked into the phone. To us, the tile-based interface is a poor man's Windows Phone that's nowhere near as pretty. Then there's the never-ending scrolling list of toggles in the notification bar. The Kestrel's approach to navigation and organisation is like someone doing the washing and then dumping it on the floor rather than tidying in the drawer.

VERDICT: We like the EE Kestrel, but we don't like its design or the build quality, and we hate its user interface and the undeletable EE apps messing up the screen. In other respects, it has a lot going for it. Whereas network operators haven't yet been able to make 4G connectivity available UK-wide, at least the hardware on which to enjoy it's now available to those on tight budgets. At £109, you get a pretty good screen, better performance than you should probably expect at this price, and the promise of 4G connectivity if it's available in your area.



HTC DESIRE 500

£199 inc VAT • htc.com/uk • tinyurl.com/orggtpj

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

The HTC Desire 500 is arguably one of the best-looking smartphones available for this price. Measuring 132x67x9.9mm, we found it fit snugly in our hand, and weighing just 123g, it's not too heavy either.

The case is made from solid-feeling plastic that has a highly polished finish. One downside is the thickness of the bezel surrounding the screen, particularly top and bottom, which isn't ideal, but it is to be expected on a handset at this price. There are a series of holes across the top for the earpiece speaker, which give the impression it will deliver good sound. Sadly it doesn't offer any real audio advancement compared to other smartphones.

Decent specs

When first launched last year, the Desire 500 offered one of the best-looking set of specs you could find. The Qualcomm quad-core Snapdragon processor was a real plus point, and its partnership with the 1GB of onboard RAM was reflected by the nippiness of the device when flicking around the home screen, and when opening and closing apps.

The amount of storage on offer is a bit of a mixed bag. The 4GB of internal flash storage won't be enough to store all the media content and apps you might want – especially if you use apps such as Spotify, which download additional files within the app. The phone does go some way to redeeming itself, though, with the inclusion of a microSDXC card slot, that enables you to boost the storage by up to 64GB.

The onboard cameras offer decent quality. The 1.3Mp front-facing camera is more than good enough for Skype video conversations and for taking selfies, while the rear-facing 8Mp offering comes complete with an LED flash. This will take snaps and videos with more than enough quality for the typical social-media application purposes.

HTC seems to take its software rather seriously. Given the company's history of redesigning the standard Google interface, it's tempting to think that this Android licensee wants to differentiate itself as much as possible with its own software design and features. The Desire 500 is no different in this respect, and comes with HTC Sense 5.0 laid over the regular Android interface.

Bloatware

This can get in the way, though. One of the more intrusive pieces of bloatware here is the HTC BlinkFeed. In essence, it's a newsfeed consisting of images and text that automatically update across your home screen. It's a feature that looks stylish, but it's not necessarily something that every smartphone user wants shoved in their face when they first unlock their phone.

When we first tested the Desire 500, it was running Android 4.1 (Jelly Bean), although we understand that unlocked models can now receive Android 4.4 (KitKat) and HTC's latest Sense 6 release.

From our time using the device, it was able to get us through a day of normal usage with no real drama, but if you're using location-tracking apps such as Facebook and other social media on the phone, it will naturally drain more quickly.

There's a handy battery saving mode that aims to conserve the device's power by limiting its access to data and turning down the screen brightness and processor usage. During our tests, we found this to be effective when switched on.

VERDICT: The HTC Desire 500 is a great-looking device, with plenty of unique software and solid mid-range smartphone specs on board. It has no major weaknesses compared to similar Android handset, although at the price of £199, it can now be bettered for less.



MOTOROLA MOTO E

£89 inc VAT • motorola.co.uk • tinyurl.com/moj7L7e

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

The Moto E looks like the Moto G (opposite), and the Moto X (tinyurl.com/mvdcuq) for that matter. It has the same curved rear cover and what Motorola describes as an “edge-to-edge” display. However, there’s still some bezel either side of the screen. The look is simple and uncomplicated. It’s just sometimes difficult to remember which way up the device goes because of its symmetrical shape, not helped by an ear piece at the top that’s smaller than the combined mic and speaker at the bottom. Dirt also tends to collect in these.

The pebble-like shape and feel helps it fit neatly in the hand. It’s not the thinnest smartphone around at 12.3mm, but that’s not an issue. It’s also no heavier than the Moto G at 142g.

Motorola has decided to offer both black and white fascias with interchangeable shells for the rear. The Moto Shell for the Moto E comes in nine different colours. Although the rear cover comes off, you can’t access the battery, only the SIM and SD cards.

For the price, the Moto E is well built and feels more expensive. At that low price, it’s no surprise it has a lower spec than the Moto G. It’s got a smaller screen at 4.3in compared to 4.5in and a slightly lower resolution, too, but 540x960 pixels on a phone this cheap is still impressive feature, giving a pixel density of 256ppi.

Under the covers is a Qualcomm Snapdragon 200 chip, a 1.2GHz dual-core processor with 1GB of memory. Handling graphics is an Adreno 302, 400MHz single-core GPU. The performance is good. You do get the occasional sign of lag, but most of the time the Moto E is smooth and switches between apps quickly. Web browsing is jerky, though, and the phone takes a couple of seconds to zoom in when you double-tap.

There’s just 4GB of internal storage, standard for a cheap phone, of which 1.5GB is available to use. However, Motorola includes a microSD card slot that can handle up to 32GB.

It has Wi-Fi, Bluetooth (4.0 Low Energy) and GPS, but nothing fancier. The device is limited to 3G mobile networks, so if you want 4G on a budget, take a look at the Moto G 4G or EE Kestrel.

There’s no front camera, but at the rear is a 5Mp snapper, which has the same resolution as the Moto G, but without LED flash. The Moto E takes reasonable photos and videos, but only in good light conditions and even then, they’re nothing special. There are auto and panorama modes, but little else in the basic app, which takes photos when you touch the screen. You can switch on a mode that overlays a draggable onscreen bracket to select a focus point. Unfortunately, it can’t focus on anything close by.

The Moto E comes with a plain version of Android 4.4 (KitKat), adding some of its own software. This is great and keeps things nice and simple for users, providing a sort of blank canvas. Motorola has also included some of its own apps, such as Motorola Migrate, Motorola Assist, the firm’s camera software and an FM radio app. It also comes with Motorola Alert, which lets people know you’ve arrived safely somewhere.

The 7.3Wh battery is only marginally smaller in capacity to that in the Moto G. Motorola says its smartphone will last a day and we can vouch for that. Most users will have to charge the device every night unless they are a particularly light user, not checking social networks regularly. There’s just the basic Android battery saver, which will restrict background data when the power is running low.

VERDICT: Motorola set a new benchmark for the budget smartphone with the Moto G, but has gone even lower on price with the Moto E. Although we’re impressed with the Moto E which will make a great first or spare smartphone, it still may be worth paying the extra for the Moto G, which is now £99 on PAYG.


PC ADVISOR
BEST BUY

MOTOROLA MOTO G 4G

£160 inc VAT • motorola.co.uk • tinyurl.com/kskspz7

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

We've been using the Moto G since launch and we still really love this phone. It's relatively cheap, cheerful and reliable. Every time we pick it up we're blown away by the stunning screen, which you just don't get on gadgets this cheap. Performance is excellent, too, partly thanks to software updates, including Android 4.4 KitKat.

Nevertheless, the Moto G isn't flawless. The 5Mp camera is just passable, which means we're less likely to get snapping. Our main worry remains with the storage. Our 8GB model was seriously lacking in space for the apps we want to use. The larger 16GB version is a wiser investment, although a revised Moto G with microSD card slot and 4G LTE is now available. If you want to buy this Moto G, be careful you don't get fobbed off with the older version.

Pebble-like is a good way of describing the Moto G's design and build. It's not particularly thin or light - 11.6mm and 143g - but feels nice in the hand with its rounded soft-touch rear. The phone is well-made, robust and feels like it should cost more than it does.

Silver power and volume buttons sit on the side and the two ports, headphone and USB, sit at either end of the handset. Interchangeable coloured Moto Shells mean you can customise the phone easily. There's also a Flip Shell cover which replaces the existing rear cover.

It's astonishing that the Moto G has a 4.5in, 720x1280 screen, giving the same pixel density as the iPhone.

The cameras can shoot in burst, panorama and HDR modes. Geotagging is a useful option, rare for a budget smartphone, while the HDR mode has an auto setting for the phone to decide whether it's necessary or not. There's no option on picture quality, but you can switch between 16:9 widescreen and 4:3 aspect ratios.

Motorola has tweaked the camera app, so you can touch anywhere on the screen to take a snap - this means you'll be dependent upon the autofocus. You can still control focus manually

by switching it on in the slide out menu. With it switched on, you drag a circle round the screen to choose your focal point. Video can be shot in 720p HD and there's a slow-motion recording mode. You can select a particular section of the clip to be slowed down while the rest remains full speed.

KitKat

As we noted earlier, the Moto G has been updated to Android 4.4 KitKat. Although it doesn't look dramatically different on the surface, it brings a number of new features, as well as bug fixes and enhancements. For example, a location services tile has been added to the quick settings portion of the notification bar for starters. That's a minor addition, but a much bigger one is KitKat's Immersive Mode, which allows apps, such as Play Books, to go full-screen.

The interface is predominantly vanilla, which is good, but there are a handful of Motorola flavoured additions. Motorola Migrate, for example, lets you bring all your content such as photos, videos and text message history - as long as your old phone was Android. Motorola Assist helps to avoid disruptions by muting your phone when you're in a meeting or asleep which we've found extremely handy. It does this by looking at your calendar.

The rear cover is removable and you can see the 7.7Wh battery, but not actually remove it. Motorola touts 'all day' battery life for the Moto G and this is certainly the case in our testing. The Moto G will only last a day unless you are a light user.

VERDICT: The Moto G is the best budget Android phone around. For £160, it has great build quality, an excellent screen, decent cameras and the latest software. Older versions are still on sale without microSD and 4G for around £120.



SONY XPERIA M2

£230 inc VAT • sony.co.uk • tinyurl.com/nteppty

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

The Xperia M2 joins Sony's line of Google-based smartphones, a model with a 4.8in display. It's smaller and much cheaper than its high-end 5.2in sibling, the Xperia Z2 (page 83), which costs £569 against the M2's £230, but its specs are less impressive.

It's a simple, square device with a glass front and back joined by mirrored, metallic edge. The combination of glass and metal often found in flagship devices gives the M2 a premium look and feel. It's 8.6mm thick and weighs 148g, and is comfortable in the hand. We tested a black model, but the M2 is also available in purple or white. Sony's circular power button protrudes from the middle of the right side, below a sealed flap that covers the SIM and microSD card slots. There are no physical buttons on front.

Squeezing 540x960 pixels into the 4.8in screen gives it a pixel density of 229ppi. That's much lower than an iPhone's 326ppi, but we found it was sharp enough, even when reading small text. Viewing angles are also good, though, the screen is reflective and shows up fingerprints and smudges.

On the inside

During our tests, we found that the M2 coped well with the majority of tasks. It has a Qualcomm Snapdragon 400 quad-core processor clocked at 1.2GHz, so is comparable with the Motorola Moto G (page 75). The phone was responsive with little or no lag, though, it did struggle with the Camera app - more on this later.

You get 8GB of storage, of which just 5GB is available. There is, however, a microSDHC card slot, so you can add an extra 32GB. Sony has partnered with Box (box.com) to offer 50GB of free storage for life, a real boon.

The Xperia M2 offers NFC and 4G LTE, 802.11n Wi-Fi, Bluetooth 4.0, GPS and a Micro-USB port. However, unlike some Sony phones,

the M2 doesn't have metal contacts for a docking or charging station - the only charging option is via USB.

The 8Mp rear camera can capture 1080p videos, and while it has an LED flash, it's quite harsh (as many flashes are). The M2's front camera is a fixed focus 0.3Mp offering, so don't expect great results. It's capable of capturing 480p video. A dedicated camera button makes launching the Camera app easier, and also acts as a shutter release. Features in the app include scene selection, HDR and panorama, as well as options such as Timeshift Burst and Picture Effects. Unfortunately, photo quality is less than satisfactory - images are oversharpened, accentuating noise and grain. And it's slow - a minute or more to view shot images.

The M2 currently runs Android 4.3 Jelly Bean, but Sony says it plans to upgrade to version 4.4.2 KitKat in the future. The Android interface is, however, clean and simple, though, it doesn't have any interesting extra features, aside from the Stamina Mode. You do get access to Walkman, Sony Select and PlayStation Mobile apps.

The battery life of the Xperia M2 is impressive - we found it could last for two days of normal use between charging. We watched videos, played games, browsed the web and made phone calls, and never had to charge our M2 more than once in a day and a half. The battery may last even longer in Stamina Mode, which switches off Wi-Fi, data and background activities when the screen is off.

VERDICT: The Sony Xperia M2 certainly looks like a premium smartphone, but selling for closer to £200. With a decent camera and more storage, we'd be more impressed with the Xperia M2 for that price, but we think you can get more for your money elsewhere. It's worth investigating the cheaper Moto G, or if you've got the extra budget the Google Nexus 5 (page 78) is worth a look.



ZTE BLADE V

£100 inc VAT • ztedevices.co.uk • tinyurl.com/mze2yh8

If your budget is limited, then the Blade V could be what you're looking for. It's chunky at 10.3mm, but light at 130g. It's a nice size for one-handed use and the curved rear cover allows it to sit well. The buttons are laid out in a typical fashion, and although the Micro-USB port is located on the left-hand side this isn't an issue. The power button is more of a problem, though, as it's too small and doesn't have enough travel to it.

From the front, the device is rather plain, with a fat bezel and a large camera lens above the screen. The brushed aluminium rear is slightly more stylish - blue in colour, with a silver bezel around the camera. Although the handset seems strong and robust, it feels plastic and tacky. The rear cover is removable giving access to the SIM-card slot, battery and microSD card slot.

Display

By Android standards, the Blade V's screen is small at 4in, but because the navigation buttons are located below the display rather than on it, more of the screen space is utilised. Its resolution of 480x800 and pixel density of 233ppi matches other budget handsets such as the Nokia Lumia 520 (tinyurl.com/of3rjo2) and Huawei Ascend G330 (tinyurl.com/q9q9shv); however, Motorola reset expectations at the price with its Moto G (page 75), which has a 720x1280 resolution and a much crisper display.

It's one of the cheapest quad-core phones around. In this case, it has a 1.2GHz Qualcomm Snapdragon processor, accompanied by 1GB of memory. For a budget smartphone, the performance is above average, though, it's not without problems. The interface often lags when switching between apps, for example. Storage is also an issue - it has only 4GB of RAM, and of this just 1GB is available to use. Luckily, there's a microSD card slot boosts this to 32GB.

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

A 5Mp camera at the rear of the Blade V has an LED flash. ZTE offers three filter effects, and there's a panorama mode with which to experiment. We don't rate its photo-taking skills highly, though. It produced low levels of detail in good lighting and struggled to focus.

Video footage can only be captured at 480p and doesn't look good. The camera also continually tried to refocus while shooting. The front-facing camera is a lowly VGA resolution but produced a better image than we expected.

Jelly Bean

The Blade V is behind the times, running Android 4.1.2 (Jelly Bean). There's full access to the Google Play store for apps, games and media content, but newer features such as Google Now and lockscreen widgets are missing.

Despite being fairly vanilla, ZTE has customised some of the software interface. A very different looking lockscreen gives a green button, which has petal-like sections to access apps. A long press unlocks the phone rather than the traditional swipe.

ZTE also preloads a number of apps on to the phone, including Kingsoft Office, World Time, Torch, Accuweather, Amazon Kindle, Twitter and Facebook. Unfortunately, they can't be uninstalled.

With a 6.6Wh battery inside the Blade V, we weren't expecting anything special in terms of battery life, and we were proved right. You should get a day out of the handset before needing to recharge it, and light users may just manage to get two days.

VERDICT: With its extremely low price, the ZTE Blade V is a good budget smartphone. It has a respectable screen and design, but falls down on cameras and software. If you can afford the extra for a Motorola Moto G, you'll get a much better all-round experience.

FLAGSHIP MODELS



GOOGLE NEXUS 5

£299 inc VAT • google.co.uk • tinyurl.com/nhLgc74

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

Google teamed up with LG for the previous generation Nexus 4 (tinyurl.com/d7htpfj) and has kept that partnership alive with the Nexus 5. It has a simple understated style - none of the spangled glass rear of its predecessor - and is available in black and white. The rear is slightly curved, helping it to sit nicely in the hand. Build quality doesn't match up to rival flagship phones, although it has a good feel. It's 8.9mm thick and 130g - thin and light for a large-screen model.

You might think that to keep the price down Google has scrimped on specifications. After all, the Nexus 4 was a little behind the competition in a few areas. Inside, the Nexus 5 has a speedy Qualcomm Snapdragon 800 chip with Adreno 330 graphics power it, backed with 2GB memory. Google has sensibly made capacities of 16- and 32GB available, but like its predecessor there's no card slot.

The phone has a 5in full-HD IPS screen, with a 1080x1920 resolution and pixel density of 445ppi. Covered in Gorilla Glass 3, the display is beautifully rich, clear and responsive, and has the great viewing angles you'd expect from an IPS panel.

The Nexus 5 is well-rounded in terms of connectivity, even if it doesn't have an infrared transmitter for controlling your TV like a few rival devices. It's got dual-band Wi-Fi with the latest 802.11ac standard, Bluetooth 4.0 low energy and GPS. Once again, the Micro-USB port is SlimPort enabled, which means it supports video output to a larger display like TV if you buy an appropriate adapter.

You might think, based on the large lens on the back of the phone that the Nexus 5 has been given a significant camera upgrade. It's still 8Mp but Google says it's better than the Nexus 4 because it's able to capture more light. Another addition is optical image stabilisation, which helps keep photos and videos shake free.

Images are fine, but other flagship smartphones outpace the camera in detail and exposure. The Nexus 5 takes its best photos

using the HDR+ mode, switched off by default. Video quality wasn't as good as we'd hoped with poor detail at 1080p. Annoyingly the camera continuously focuses during filming.

The camera app is simple, easy to use and includes panoramic and photo sphere modes. 'Auto Awesome' creates animations, photo booths and panoramas using the content in your library. There's no burst mode, but you can download third-party apps.

With the Nexus 5 comes with Android 4.4 KitKat. The interface is clean, simple and colourful - as you'd expect from 'vanilla' Android. It's easy and intuitive to use, especially when compared to the overly complex skins that Google's manufacturing partners slap on.

Detailing, including the status bar, is now white and new app icons keep things looking fresh. The same is true of the switch to transparent status- and button bars instead of solid black ones, allowing the wallpaper to take over more. Full screen album art on the lock screen looks slick. As well as a new look, the interface runs better than before. Multitasking is snappier, too, so the OS feels more responsive than previous Android phones.

Mirroring Apple's iMessage, the new Hangouts app combines Google's IM system with your regular SMS text messages. However, Hangouts separates SMS and instant messages from the same person into different threads, which rather defeats the point.

At 8.5Wh, the battery is smaller than some large-screen Androids. We found battery life mediocre, just a day of regular use before needing a charge. Only very light users will get any more life out of this smartphone. It charges fast, and wirelessly, too, if you buy a compatible charger to keep it topped up.

VERDICT: Google and LG have done a fantastic job with the Nexus 5. Its better than the Moto G, but isn't as good value



HTC ONE M8

£510 inc VAT • htc.com/uk • tinyurl.com/nj6s89L

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

HTC's aim with this smartphone was to take the original HTC One (tinyurl.com/o3L2dg3) and make everything better. One thing's for sure: there are no major leaps with the M8, but we're seeing a similar trend with all new flagship smartphones this year.

Once again, the Taiwanese firm has used a unibody aluminium design, but the metal wraps around to the front rather than having a plastic strip around the edge. The corners of the phone are also more rounded. It has a brushed look and has been treated to gain its glossy finish.

A larger screen means that the phone is taller and wider than its predecessor, but it didn't feel too large in our hand. It's heavier at 160g against the previous iteration's 143g, making it one of the weightiest smartphones in this group test, though, it feels solid.

The back of the device is home to what HTC calls the Duo Camera - two lenses. The primary camera is the same Ultrapixel offering found on the M7. According to HTC, the ImageChip 2 means the camera can shoot faster and capture sharper images, and that was certainly true in our preliminary tests.

At 4Mp, there isn't as much detail in photos compared to the M8's rivals, but because its pixels are bigger, it's better suited to low-light situations. The second camera is there to capture depth information. Metadata is attached to the photo taken with the main lens.

The M8 can also record video in full HD. Unfortunately, video quality is unimpressive. There's no stabilisation and footage wasn't as sharp or detailed as we'd have liked, and not a patch on the Samsung Galaxy S5's (opposite) video quality. On the front is a 5Mp camera with a wide-angle lens.

HTC has expanded the screen size from 4.7- to 5in. The resolution, as with Google-based rivals, remains at 1920x1080. The larger size means a dip in pixel density to 441ppi, but you're unlikely to notice.

The phone may be bigger, but HTC has done a good job of making it feel the same. The display is crisp, vibrant and looks stunning, with improved contrast ratio and viewing angles.

The M8 uses Android 4.4.2 KitKat - the current latest version from Google. Its Sense 6.0 interface introduces some new features. Navigation buttons, for example, are onscreen like many other Android smartphones. The move means that there are three buttons instead of two. A dedicated button for accessing the recent apps screens makes things easier.

HTC uses LG's KnockON feature to wake the display with a double-tap. Motion Launch Gestures take it further. Swiping left, for example, opens the widget panel, while moving right takes you straight to BlinkFeed - HTC's newsfeed feature. Swiping upwards unlocks the device, and you can launch the camera app by holding the phone in landscape orientation and then pressing a volume button. We found these gestures just the kind of handy features that make life easier.

There are other minor tweaks, but customisation has been improved with the ability to select different theme. In a similar way to other phones that use themes, a wallpaper is tied in with a particular colour, which is then used throughout that software - the settings menu, for example.

The battery has been increased in capacity and HTC says the M8 will last up to 40 percent longer than its predecessor. The battery isn't removable, but this isn't too surprising. In real-world use, it lasted roughly 24 hours, with average use of phone calls, texts, web browsing, gaming and YouTube videos.

VERDICT: The HTC One M8 looks and feels gorgeous and with important upgrades including an innovative camera. This is a very desirable smartphone.



HUAWEI ASCEND P7

£330 inc VAT • huawei.com/uk • tinyurl.com/om8sexz

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

The Ascend P7 is Huawei's latest flagship smartphone, and at first glance looks a lot like its predecessor, the P6 (tinyurl.com/qgtfpm). True to form, the P7 is extremely thin at 6.5mm - its smaller brother is just 6.1mm but there's a lot of tech packed into the P7 and we're impressed. The main difference between the two is that the P7 has a larger screen - 5in compared to the P6's 4.7in. It retains the rounded edge at the bottom, with Gorilla Glass 3 both the front and back. As before a brushed aluminium frame runs around the edge.

For a phone with a large screen, it's amazingly light and easy to use. We like the spun metallic finish on the rear, made from seven layers. This effect goes outward, centred on the Huawei logo, when light is reflected in the right way. Beside the black/blue model we tested, it's available in white and pink options. Unfortunately, the glass rear cover has the same problem as Google's Nexus 4 (tinyurl.com/d7htpfj) - it's prone to scratches.

With a 5in screen, the Ascend P7 matches many other flagship smartphones on the market. It is big but a reasonable size in terms of balancing how easily you can reach and use it with one hand.

Its full-HD screen looks great and has excellent viewing angles, although its brightness needs setting at the top end of the scale for comfortable viewing, especially when outdoors.

Inside is a 1.8GHz Kirin 910T quad-core processor coupled with 2GB of memory. We found the P7 runs smoother than the P6, but it's not a completely silky experience. The interface often juddered when we pulled the notification bar down, and generally things got a bit sticky when running several apps and tasks. We also had issues such as the P7 refusing to open Twitter by tapping the icon - we could only access it by way of recent apps for a good period of time.

The P7 has a 13Mp camera at the rear, with a fourth-generation Sony sensor, and it's a cracker. It's capable of taking high-quality

photos in bright sunlight or indoors in candle light. You can double-press the volume key to launch the camera and take a photo from sleep, or switch it to a shutter button. An 8Mp front camera has a five-piece lens and Huawei has coined the phrase 'groufies' (group selfies) for a group panorama taken with the front camera. It's a central photo, then one either side after turning the phone.

Huawei has loaded the Ascend P7 with Android 4.4.2 (KitKat), adding its Emotion UI on top. This skin doesn't have an app menu, so the homescreen is similar to that of an Apple iPhone. It seems much nippier than before, though, which was the main down side to the P6 as a smartphone. What we like about Emotion UI is the amount of customisability on offer. There are lots of themes to choose from and you can further tweak aspects to personalise the software. These include home screen panel transitions, icons and fonts.

The battery is rated at 2500mAh and is non-removable. Echoing the Samsung Galaxy S5 (page 82), the P7 has an ultra power-saving mode, supposedly to make the phone last 24 hours on 10 percent charge. Just like the S5, you get a black-and-white interface and basic functions such as text and calls.

Most users will need to charge their P7 every night. When we used it for emails, a few photos and social networking, it was nearly empty by evening. With lighter use, the P7 will last a couple of days but as we said, most users will find it offering the now classic one day. All day battery life may be impressive on a budget phone like the Moto E but on a flagship device like the P7 we want more.

VERDICT: Huawei has produced a stunning smartphone in the Ascend P7, that's good value if priced as expected. There's some decent hardware on offer here, particularly the camera, but the P7 is let down by software performance issues.


PC ADVISOR
BEST BUY

LG G3

£479 inc VAT • lg.com/uk • tinyurl.com/mq8dhuu

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

The LG G3 is the follow-up to our favourite Android phone of last year, the LG G2 (tinyurl.com/pafk4sz). Measuring 8.9x75x146mm, this is a large phone, though, no bigger than its Android rivals.

A brushed metal frame running around the edge, which separates front from back. The rear is removable and made of plastic; not as premium-feeling as the HTC One M8 (page 79), but a step up from its predecessor and assorted plastic rivals. The phone's buttons are located on the back next to the camera. We weren't sure about this when it was introduced on the G2, but it's actually and makes sense. The new textured buttons don't stick out so much either.

This G3 was the first smartphone to offer a 'Quad HD' resolution - so far Full-HD has been standard. It offers a whopping 1440x2560, giving this 5.5in display an incredible pixel density of 534ppi. The screen looks stunning, comparable to a high-quality photo book. Everything on the is super crisp; no matter how hard you try, you just cannot see any single pixel. Viewing angles are great, and LG has struck a great balance with the colour too; it's not in your face like Samsung's displays nor overly soft either.

A Qualcomm Snapdragon 801 processor matches rivals on this front, here clocked at a high 2.5GHz. It's not surprising that performance was smooth and nippy, though, we did see occasional lag. Either 16- or 32GB of internal storage is offered, and 3GB of memory in the larger capacity model, while its sibling gets 2GB. A microSDXC card slot can accept cards up to 128GB, accessible underneath the rear cover without removing the battery. Connectivity runs to 11ac Wi-Fi, Bluetooth 4.0, NFC and an infrared transmitter, plus LTE-Advanced and wireless charging.

The LG G2 was the first smartphone to allow 24-bit/192kHz audio, pleasing audiophiles. The G3 adds a 'boost amp' to improve sound - the speaker is impressively loud, if rear facing.

The G3's main camera takes 13Mp stills, but more impressive is 4K video recording. And laser autofocus shoots a cone-shaped beam to focus much quicker. Optical image-stabilisation kept shots shake-free while 'touch and shoot' removes unnecessary buttons so you can concentrate on getting the right shot. You can quick launch the camera from sleep by holding the volume down button.

Against the HTC One M8's Duo Camera, the LG G3 gets 'magic focus'. When you get close to an object, it will take a series of photos. Tap anywhere or use a slider to select where you want the focus to be before saving the image. It works reasonably well, if you compose the shot nicely, but is more gimmicky. A 2Mp front camera can shoot full-HD video with the ability to take selfies with a hand gesture.

As you would expect from a new smartphone in 2014, the LG G3 comes with Android 4.4 KitKat. The interface is simpler and cleaner than that used on the G2. Round icons in the notification bar are similar to the Galaxy S5 (page 82), and new features include 'Smart Notice', which is similar to Google Now, and makes suggestions and tips based on tracking your location and behaviour.

A new 'slim keyboard' offers improved typing with adjustable height, size and new gestures to help you around the huge screen. You can add a button to the navigation bar, which operates the drop-down notification bar, and adjust the position of the lock screen PIN and dial keypad.

During our tests, we found that the G3's display consumed most of the power, though, we managed two days between charges.

VERDICT: LG has impressed us with the G3, which comes in at under £500, but packs amazing features including that Quad HD and a camera with a laser autofocus. It's surprisingly small considering the 5.5in display and we like the premium design.



SAMSUNG GALAXY S5

£479 inc VAT • samsung.com/uk • tinyurl.com/nhdz6od

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

The Galaxy S5 retains the same Samsung look as the company's other phones and not much has changed compared to previous generations, which is a shame because it warrants its own style as Samsung's flagship phone. It doesn't feel like a premium smartphone in the hand, though. A 'perforated' rear cover supposedly makes it feel more natural, but we can't see the benefit. Samsung has stuck with a physical home button with touch-sensitive counterparts either side. Instead of the previously used menu, we now have recent apps. The physical button is fine and houses the fingerprint scanner, but the other two are hard to reach.

We've hit a point where flagship smartphones offer excellent performance, so we weren't surprised to find the S5 nippy in day-to-day performance, though it's not flawless. For example, there's a delay between pressing the power or home button and the lockscreen appearing, and when hitting the recent apps button.

The S5 is available in either 16- or 32GB capacities. A microSD card supporting up to 64GB is almost a given nowadays, but it can take double that at 128GB. It's a good job there are plenty of storage options because a lot of the S5's internal storage is used up before you've even downloaded an app. Our 16GB unit has just under 10GB available, which is less than average.

The 5.1in display is only marginally larger than the Galaxy S4's (tinyurl.com/ca5p7Lf), and if you were expecting a higher resolution screen, you'll be disappointed. Nevertheless, it looks brilliant. Of course, it's still Super AMOLED as you would expect from Samsung, so colours are vivid and pop out at you and contrast is good, too.

The Galaxy S5's fingerprint scanner is built into the home button, but you have to swipe your finger across it. You can register up to three fingerprints and need to set a backup password because there's a five-attempt limit on using your paws to unlock the device.

Wireless connectivity is all up to date, with 11ac Wi-Fi (MIMO), NFC, Bluetooth 4.0, an infrared transmitter, and the latest 4G technology. Samsung also includes Cat 4 LTE supporting eight bands, and a download booster that uses your Wi-Fi connection combine with mobile data to give you a theoretical download speed of 400Mb/s.

The rear camera has a decent 16Mp sensor (3Mp more than the Galaxy S4) and it has a few new features. Super-fast autofocus, for example, means you can take a photo in 0.3 seconds. Unfortunately, the camera app takes a few seconds to load in the first place, so you may well miss the moment when whipping out your S5. Image quality is good, though, and the extra resolution compared to the myriad of 8Mp smartphone cameras is certainly noticeable once you start cropping photos. Videos are also decent. We didn't test the 4k mode, but Full HD videos were sharp and detailed. On the front is a 2Mp camera that can record 1080p video.

At first glance and going by the main homescreen, Samsung hasn't done much to the software despite it being Android 4.4 KitKat. However, things have tweaked here and there. Round icons grace the drop-down notification bar and settings menu is huge but you can hide and expand each section.

Samsung continues to offer a removable battery, which will please some, and its capacity has increased compared to the Galaxy S4. It's now has a 10.4Wh battery inside, and although that's not the biggest we've seen, it's about how you use and manage this power that matters. We were impressed by the battery life. After a full working day of use and testing we had two-thirds remaining. The smartphone should last most users two days.

VERDICT: Things haven't changed much from the Galaxy S4 but Samsung, as usual, has packed the Galaxy S5 with features.



SONY XPERIA Z2

£569 inc VAT • sony.co.uk • tinyurl.com/nxb5swv

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

Sony quick replaced its Z1 (tinyurl.com/kau7dyr) with this Z2 after selling its Vaio PC business to concentrate on the phone side of its business. Changes between the two handsets are very minimal. The screen is 0.1in larger at 5.2in, there's a new, almost hidden, ear piece (with notification LED), and a microphone at the top and bottom. Unfortunately, the Xperia Z2 is a little too large and the size means it's rather unwieldy - you'll need to use two hands. The build quality is excellent - the glass front and rear separated by aluminium give the device a premium and robust feel.

As we've already mentioned, the screen is a little larger at 5.2in which does mean marginally more room to do stuff, but we wish that Sony had stuck with 5in and worked on reducing the bezels to create a smaller phone than previously. It still has a Full HD resolution, which means the pixel density has dropped slightly, but it's not really noticeable - 423ppi is more than respectable. It still has Sony's Triluminos and X-Reality technologies and a new one called Live Colour LED which Sony says increases colour depth and gradation. The display may look slightly better than before - mainly viewing angles - but it's not a big jump in quality.

The Qualcomm Snapdragon 801 debuted in the Xperia Z2, clocked at 2.3GHz and backed up by a whopping 3GB of memory. The GPU remains at the Adreno 330, which is speedy and we didn't experience major lag, although like the Samsung Galaxy S5 (opposite), transition animations aren't as quick as the HTC One M8's (page 79), so it doesn't feel as snappy. The home screen content, namely widgets, can take a while to load in the first instance, but it's not a big problem. Only 16GB of storage is offered, but a microSD card slot enables up to 64GB more.

The camera has a hi-res 20.7Mp Exmor RS sensor with Sony G Lens. It remains the highest res available on an Android handset. It

can record video up to 4K resolution at 30fps, while full-HD goes up to 60fps. Alongside, the Superior Auto mode, which ensures general shots look good, a Background Defocus mode gives a DSLR-style shallow depth effect. You can't refocus like the HTC One M8, but it works well in the right conditions. The front camera has been given a small boost to 2.2Mp and records video in 1080p at 30fps. Expect decent quality for your selfies and video calling.

Sony's user interface sits over Android 4.4. It's much lighter and close to stock Android than HTC's Sense and Samsung's TouchWiz. The main change is that the drop-down bar is now split into two tabs: notifications and quick settings, matching more vanilla devices such as the Google Nexus 5 (page 78). You can easily edit which quick settings you want access to and their order.

Annoyingly, Sony has changed the cool animated blind effect on the lock screen to a fairy-dust affair and you can't change it. It is made redundant if you use an unlock pattern, PIN, password or Face Unlock. There's also no option to add widgets to the lock screen or launch apps, besides the camera. Sony doubles-up with its own apps - Walkman, Album, Movies - but they're good, so we don't mind that. Other preinstalled apps include Vine, Garmin Navigation, Pixlr Express and OfficeSuite, and you can delete the ones you don't want.

The battery is still non-removable, but larger at 11.8Wh. Runtime is one of the best around and can easily last a couple of days with regular use - and that's without switching on Sony's excellent Stamina Mode, which conserves the battery level even more by disabling functions like Wi-Fi and mobile data when the screen is off.

VERDICT: Although little has changed from the Z1, the Xperia Z2 is another solid effort from Sony. The smartphone is a good all-rounder with a great screen, camera, build quality and performance.

» Conclusion

Conclusion

Google's Android system is the mainstream mobile computer platform of today. For many people, it enables more affordable access to a smartphone that can dip into the web at will, and keeps personal email, texts and instant messaging close to hand. And there's a huge range of applications available to add extra function to the phone from Google's download shop, the vast majority of which are safe and free from dangerous malware.

At the premium end of the market are giant-screened telephones with which you can more comfortably watch films, and read

web pages and social-media feeds. These big phones maintain pixel resolution that exceeds what's required to give a dot-free image, with some like the LG G3 doing so by a huge margin. And while this can provide sharper-than-sharp images, beware of specs and features added purely for one-upmanship - unless, of course, you're chasing these specs to impress your friends.

All our flagship samples run the current Android 4.4 nicknamed KitKat, although at time of press all except the Google Nexus 5 were six months and two versions behind in security patches. Be warned that cheaper

Androids may have even older software with less hope for timely security updates, let alone full operating system upgrades.

From our top-price selection, we found the Samsung Galaxy S5 was just too much of a me-too product, still copying the iPhone with features such as fingerprint recognition; still failing to execute the technology properly and ultimately disappointing the user. Huawei is keen to get a seat at the big-boys table, but doesn't make a compelling statement with its Ascend P7, despite ticking several boxes on paper. It's one of the cheapest flagship

Budget smartphones

	EE £109 inc VAT (£90 ex VAT)  PC ADVISOR RECOMMENDED	HTC £199 inc VAT (£165 ex VAT) 	MOTOROLA £89 inc VAT (£74 ex VAT) 	
Product name	Kestrel	Desire 500	Moto E	
Display size	4.5in (540x960, 245ppi)	4.3in (480x800, 217ppi)	4.3in (540x960, 256ppi)	
Display type	TFT	TFT	TFT	
Processor	1.2GHz Qualcomm Snapdragon 400 (quad-core)	1.2GHz Qualcomm Snapdragon 200 (quad-core)	1.2GHz Qualcomm Snapdragon 200 (dual-core)	
Graphics	Adreno 305	Adreno 305	Adreno 302	
Operating system	Google Android 4.3 (Jelly Bean)	Google Android 4.1 (Jelly Bean)	Google Android 4.4 (KitKat)	
Memory	1GB	1GB	1GB	
Storage	8GB	4GB	4GB	
Card slot	microSDXC	microSDXC	microSDHC	
Cellular	4G LTE	3G	3G	
SIM type	micro-SIM	micro-SIM	micro-SIM	
Wi-Fi	802.11b/g/n	802.11b/g/n	802.11b/g/n	
Bluetooth	4.0	4.0 with aptX	4.0	
GPS	A-GPS	A-GPS	A-GPS	
Camera(s)	5Mp rear camera with LED flash; 1Mp front camera	8Mp rear with LED flash; 1.3Mp front	5Mp rear camera only	
Video	1280x720	1280x720	1280x720	
Other	None	None	None	
Battery	7.4Wh non-removable	6.7Wh non-removable	7.3Wh non-removable	
Dimensions	133x65x7.9mm	132x67x9.9mm	65x125x12.3mm	
Weight	145g	123g	142g	
PERFORMANCE				
Geekbench 3 (points)	1152	826	608	
SunSpider (ms)	1150	1089	1877	
GFXBench T-Rex (fps)	14	N/A	11	

*SunSpider 1.0

devices, but if it's your money and not a 'freebie' we'd counsel shopping elsewhere.

For around £30 less there's the Google-subsidised Nexus 5, which incorporates all that Android will do, albeit without the flashiest of cameras. The Sony Xperia Z2 boasts some of the best photography alongside 4K video capture. With the largest battery on test, it's also got unusual stamina for an Android phone, easily lasting into a second day of use.

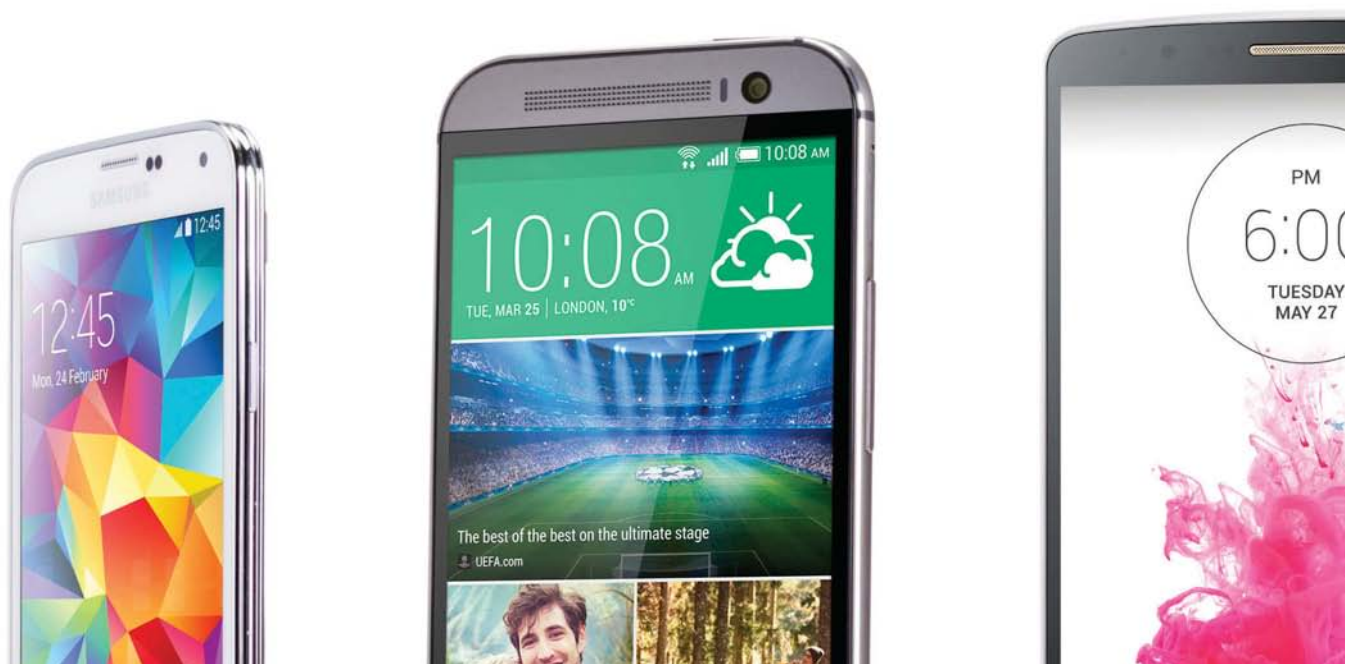
The remaining HTC One M8 and LG G3 are our current champions of top-price Androids. They run the same Qualcomm

chipset as every other phone here, but are distinguished by great build quality, especially so in the case of the One M8, which is Apple-like in its craftsmanship and all-metal design. Creative photographers can take advantage of its focus-shifting Duo camera, and 4K video, too. The LG G3 adds higher-quality audio and a decently dimensioned chassis, considering its huge 5.5in 'quad-HD' display.

At the more affordable end of the scale, our favourites were the Motorola Moto G 4G for its accessible circa-£160 price SIM-free. If you don't need 4G, and a microSD card

slot for extra storage, then the old model is even more affordable at just £120. Still currently a subsidiary of Google pending sale to Lenovo, Motorola phones are kept relatively up-to-date with software, and both Moto E and G models are budget classics, although it's worth seeking the G for its more responsive interface and Retina-class display. If you feel the need for 4G LTE on a shoestring, a locked PAYG from UK network EE can be found in the Kestrel. We found its case plasticky, but economy phones are built down to a price rather than up to a standard. ☒

MOTOROLA £160 inc VAT (£133 ex VAT)  PC ADVISOR BEST BUY		SONY £230 inc VAT (£191 ex VAT) 	ZTE £100 inc VAT (£83 ex VAT) 
Moto G 4G		Xperia M2	Blade V
4.5in (720x1280, 326ppi)		4.8in (540x960, 229ppi)	4in display (480x800, 233ppi)
TFT		TFT	TFT
1.2GHz Qualcomm Snapdragon 400 (quad-core)		1.2GHz Qualcomm Snapdragon (quad-core)	1.2GHz Qualcomm Snapdragon (quad-core)
Adreno 305		Adreno 305	Adreno 305
Google Android 4.4 (KitKat)		Google Android 4.3 (Jelly Bean)	Google Android 4.3 (Jelly Bean)
1GB		1GB	1GB
8GB (16GB available)		8GB	4GB
microSDHC		microSDHC	microSDHC
4G LTE		4G LTE	3G
micro-SIM		micro-SIM	micro-SIM
802.11b/g/n		802.11b/g/n	802.11b/g/n
4.0		4.0	4.0
A-GPS		A-GPS	A-GPS
5Mp rear camera with LED flash; 1.3Mp front camera		8Mp rear camera with LED flash; 0.3Mp front camera	5Mp rear camera with LED flash; 0.3Mp front camera
1280x720		1920x1080	640x480
None		NFC	None
7.7Wh non-removable		8.6Wh non-removable	6.6Wh removable
66x130x11.6mm		140x71x8.6mm	64x126x10.9mm
143g		148g	130g
1162		1076	552
1512		1647	2665
11		15	5



Flagship smartphones

	GOOGLE £299 inc VAT (£2549 ex VAT) ★★★★★	HTC £510 inc VAT (£425 ex VAT) ★★★★★ PC ADVISOR RECOMMENDED	HUAWEI £330 inc VAT (£275 ex VAT) ★★★★★	
Product name	Nexus 5	One M8	Ascend P7	
Display size	5in (1080x1920, 445ppi)	5in (1920x1080, 441ppi)	5in (1080x1920, 445ppi)	
Display type	IPS	Super LCD3	IPS	
Processor	2.26GHz Qualcomm Snapdragon 800 (quad-core)	2.3GHz Qualcomm Snapdragon 801 (quad-core)	1.8GHz Hisilicon Kirin 910T (quad-core)	
Graphics	Adreno 330	Adreno 330	Mali-450MP4	
Operating system	Google Android 4.4 (KitKat)	Google Android 4.4 (KitKat) with Sense 6	Google Android 4.4 (KitKat) with Emotion UI 2.3	
Memory	2GB	2GB	2GB	
Storage	16GB (32 GB available)	16GB	16GB	
Card slot	None	microSDXC	microSDXC	
Cellular	4G LTE	4G LTE	4G LTE	
SIM type	micro-SIM	nano-SIM	micro-SIM	
Wi-Fi	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11b/g/n	
Bluetooth	4.0	4.0 with aptX	4.0	
GPS	A-GPS	A-GPS, GLONASS	A-GPS, GLONASS	
Camera(s)	8Mp rear camera, AF with LED flash; 1.6Mp front camera	5Mp Ultrapixel Duo front camera	13Mp rear camera, 8Mp front camera	
Video	1920x1080	1920x1080	1920x1080	
Other	NFC	NFC, barometer, IR sender	NFC	
Battery	8.5Wh non-removable	9.6Wh non-removable	9.3Wh non-removable	
Dimensions	69x139x8.6mm	146x71x9.4mm	140x69x6.5mm	
Weight	130g	160g	124g	
PERFORMANCE				
Geekbench 3 (points)	2800	2761	1870	
SunSpider (ms)	801	583	1296	
GFXBench T-Rex (fps)	24	30	12	



LG £479 inc VAT (£399 ex VAT) ★★★★★ PC ADVISOR BEST BUY	SAMSUNG £479 inc VAT (£399 ex VAT) ★★★★★	SONY £569 inc VAT (£474 ex VAT) ★★★★★
G3	Galaxy S5	Xperia Z2
5.5in (1440x2560, 534ppi)	5.1in (1920x1080, 432ppi)	5.1in (1920x1080, 432ppi)
IPS	AMOLED	IPS
2.5GHz Qualcomm Snapdragon 801 (quad-core)	2.5GHz Qualcomm Snapdragon 801 (quad-core)	2.3GHz Qualcomm Snapdragon 801 (quad-core)
Adreno 330	Adreno 330	Adreno 330
Google Android 4.4.2 (KitKat)	Google Android 4.4.2 (KitKat) with TouchWiz	Google Android 4.4.2 (KitKat)
2GB (3GB in 32 GB model)	2GB	3GB
16GB (32GB available)	16GB (32GB available)	16GB
microSDXC	microSDXC	microSDXC
4G LTE	4G LTE	4G LTE
micro-SIM	micro-SIM	micro-SIM
802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac
4.0	4.0 with aptX	4.0 with aptX
A-GPS	A-GPS	A-GPS
13Mp rear camera laser AF with dual-tone LED flash; 2Mp front camera	16Mp rear camera, phase detection AF with LED flash 2Mp front camera	20.7Mp rear camera; 2.2Mp rear camera
3840x2160	3840x2160	3840x2160
24-bit/192kHz audio, NFC, IR sender	NFC, IR, fingerprint scanner, heart rate monitor	NFC, noise-cancelling
11.1Wh removable	10.4Wh removable	11.8Wh non-removable
75x146x8.9mm	73x142x8.1mm	147x73x8.2mm
149g	145g	163g
2465	2869	2796
959	824	861
20	28	29

ARTIFICIAL INTELLIGENCE

Siri, Cortana, and Google Now offer a glimpse of the future, but will our smart devices soon know more about us than we do? [Martyn Casserly](#) investigates

Intelligent computers have been the dream of technologists for many years. The idea has also proven a popular one in books and films, but the end results are often rather different. Whereas the scientists and programmers see machines that can help cure diseases, enrich the human experience by eradicating menial tasks, and at its furthest extreme, actually usher in a new form of intelligent being; Hollywood usually portrays them as the destroyer of worlds who seek to overthrow and extinguish their cruel masters.

Films such as *The Terminator*, *WarGames*, and *Transcendence* offer a future where flesh-based life needs upgrading to a purer state - or merely point to the dangers of connecting computers that control a nuclear arsenal up to the internet.

Reality has a habit of being less dramatic, and the AI revolution has quietly gone about its business with nary a global annihilation in sight. An invasion, though, is most certainly underway.

In recent years, our computers and mobile devices have gone from passive units with little agency of their own, except for scheduled updates or calendar alarms, to ones that constantly monitor our conversations, awaiting the magic words that mean we need their assistance. They silently gather information on our likes, use of language, whereabouts, habits and routines, all with the aim of being able to understand us better.

SIRI Soon Microsoft's versatile personal assistant will be able to remember more things about you that you've forgotten

As these systems grow in sophistication, and our interaction with them becomes more effortless, we could see a future where our devices know more about our lives than we do. But just how intelligent do we want these devices to become, and how much can they already accomplish?

Open the pod bay doors Hal...

When Apple launched the iPhone 4s at the end of 2011, the company didn't focus on the excellent camera, enviable security, or high-quality construction. Instead, it spent its copious advertising budget making a beta product the entire centre of its campaign.

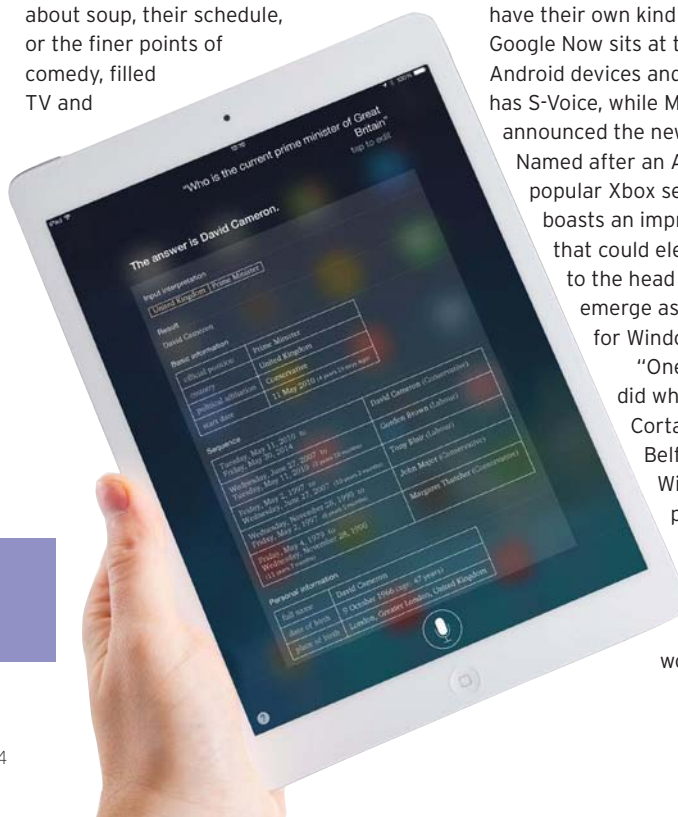
Siri became a star overnight. Images of celebrities like John Malkovich and Zooey Deschanel conversing with their new iPhones about soup, their schedule, or the finer points of comedy, filled TV and

computer screens the world over. But the endorsements weren't the factor that really caught the public's imagination. After all, Samsung and Microsoft have used the same tactics - it was the effortless way that they were interacting with their phones.

Of course, as any honest Apple user will tell you, Siri was far from the efficient PA that the adverts sold. Depending on your accent, and internet connection, the digital assistant could be far harder work. Misinterpreted commands, frustrating randomness, and complete paralysis when web access was absent, meant that it was often quicker to type things in yourself. But, in those moments when it worked, it seemed like magic. The future had arrived.

Two years on, all of the major platforms have their own kind of digital assistant. Google Now sits at the heart of the newest Android devices and Chromebooks; Samsung has S-Voice, while Microsoft recently announced the newest addition, Cortana. Named after an AI character in the hugely popular Xbox series Halo, Cortana boasts an impressive set of features that could elevate Windows Phone 8.1 to the head of the pack and possibly emerge as a new control interface for Windows as a whole.

"One of the first things we did when we conceptualised Cortana," explains Joe Belfiore, Head of the Windows Phone programme at Microsoft, "was to chat with real world, human assistants to learn how they actually worked. One technique





real world assistants spoke about was the idea of a notebook, tracking all the interests and likes of their clients. Cortana also keeps a notebook where she stores what she's learned about me, and I can view or edit this personal information whenever I want."

This information gathering is an essential element of an efficient, intelligent system, but in an age where privacy concerns are headline news, this can leave users with important choices to make about how much they share with their assistants.

Google Now monitors your internet search history, location, and general usage habits to collate a profile that allows it to suggest things that might be helpful. It can be incredibly useful, but some people find it a little unnerving that their devices are paying such close attention. There's the option to disable access to much of this data if you want more privacy, but this massively reduces the capabilities of the service.

Siri is even more elusive, with the control options open to the user scaling down to pretty much which language you want to use. A nice feature, though, is that you can teach the assistant who your mother, father, sister, partner or other close relations are, which can then be used in features such as Find My Friends.

Otherwise, it's not entirely clear what the service knows about you. Cortana's notebook feature is still quite basic, but the fact that there's one at all is, at least, a giant step in the right direction if you fret about data hoovering.

Say what you see

Of course, the most obvious area of intelligence in a computer assistant is the voice interface. There's nothing quite like

telling a program what you want and seeing it do exactly that. Nuance, the creator of Dragon Dictate, has pioneered this technology for many years, and know what it takes to make our devices seem truly smart.

"The personality of a system will be that instant thing that you latch onto about whether something is intelligent," explains John Smith, Principal Solution Architect at Nuance. "Taking you from your question to your answer in the quickest way possible. That's different to the way you and I would interact as humans to a certain degree, because we could go off on tangents and come back. An intelligent agent in the future will possibly have the capability to do that, but at the moment, it's very much about you asking it to do something and the agent being able to fulfil that wish in the quickest possible way."

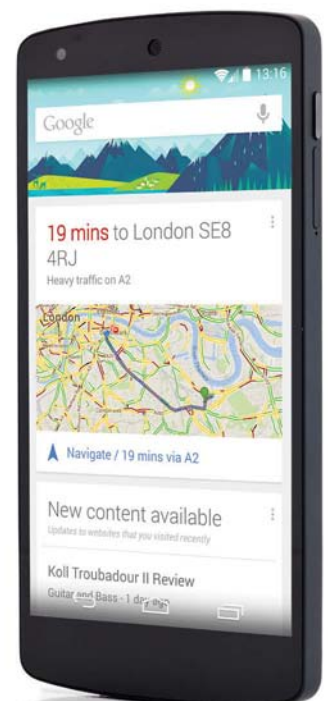
Voice control has developed to a point where it's a usable interface rather than a party trick. Google's voice search has also extended beyond mobile devices to the desktop Chrome browser. Opening a new tab on www.google.com and clicking on the microphone icon at the right of the search bar enables you to speak your search queries (so long as you have a built-in microphone), and, in many cases, Google will read the results back to you.

In recent versions, there's also the ability to ask related questions, for example: 'When was Jaws released?' Then, when the answer is given, you can ask: 'Who starred in it?' and the system will know what you mean.

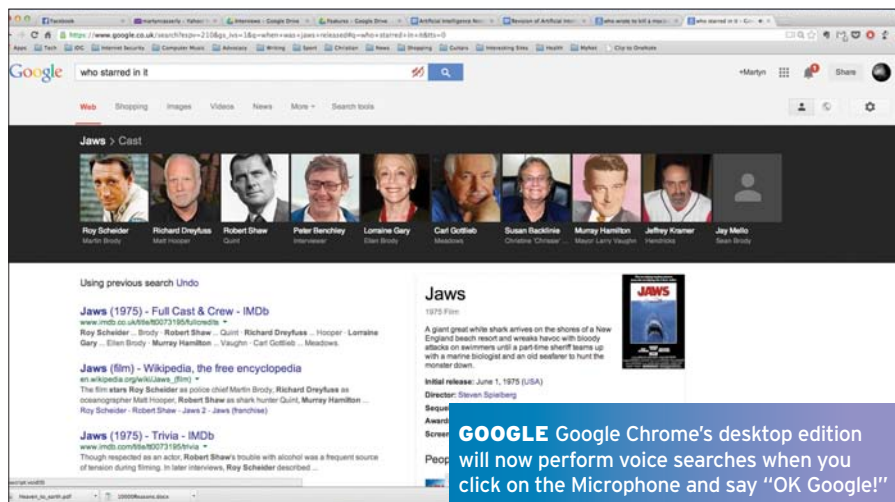
Thanks to Google Maps, you can also ask for directions to a location.

You might not realise it, but Windows has, for some time now, also had a comprehensive suite of voice control tools built into the OS. If you search for Speech Recognition in versions as far back as Vista, you'll find a program that enables you to control your PC all via spoken commands.

While voice control may still catch on when using the desktop, the personal nature of a mobile device seems to make it easier to accept. After all, we already talk into our phones, so moving to speech recognition is a much smaller mental step. Then there's the interoperability of the apps and information these devices bring.



GOOGLE NOW Google's personal assistant provides subject-based cards on your search history that it thinks might be of specific interest



In Cortana there's a novel feature which allows you to tell the handset: 'Remind me about borrowing the suitcase next time I talk to Jim!' and Cortana will monitor your contacts until Jim calls, then pop up the note. Very clever.

A major drawback of intelligent assistants is their need to be constantly online. Put your mobile device in flight mode and you're back to typing in calendar entries and reminders yourself. This is because most of the translation and processing is done on large, powerful servers in the cloud. Depending on the handset, you can have basic elements of control completed locally - say 'Launch Music Player' - but the majority will likely be online for the foreseeable future. This isn't surprising, as so much of the information an assistant needs to be intelligent is based in the cloud, anyway. This is especially true in one of the fastest developing areas in the technology at the moment - intelligent vehicles.

Smarter vehicles

"You can imagine a mapping database sitting in your car," explains John Smith. "It could be a TomTom, whatever's embedded in your vehicle, and you say to it: 'Find me the nearest petrol station'. It looks at where you are; it will know all the petrol stations around that area, and can display them. However, if you're connected to the cloud, it could actually say - 'Ah, John collects Tesco points, and he's travelling north on the M1, and I know that, so I can provide John with the petrol stations going north on the M1 that are Tesco, but I also know that he's only got 50 miles left of diesel, so I'll only provide him the ones within the area that he's going to or has the capability of reaching.' Likewise it could say: 'Ah, there's congestion here, so he possibly won't make that, I'll show the ones that are closer'.

"With Dragon Drive we've got partnerships with a number of companies so that a user can say: 'Take me to a hotel

in London' and it finds the hotel you want to go to. Again, this is a hybrid between the handset and the vehicle, so you can arrange this in the house on your handset, and then when you get in the vehicle, it's aware that you've already set these destinations. Or it could look at your calendar and say: 'Oh, you're going to this address' and put it in. But then as you go along you could say: 'Find me the nearest parking spot', and you could then use services such as Parkopedia or Parkaround to do so.

"These services already exist, it's just the method of bringing them together in a way that's usable. If you wanted to do that right now on your PC you'd use mapping software, then a piece of parking software, but you couldn't do it all in one go. The personal assistant approach is very much a proactive system. If it knew your preferences, it could do those things for you."

In many ways the car is the most obvious place for this technology to find its home. Being able to converse with an assistant verbally, organise your appointments, send email and text messages, have new arrivals

IN-CAR iOS Many of the today's vehicles have an integrated personal assistant that may even be voice activated



read out to you, and conduct web searches all without the need for a screen or physical interaction, would be a god-send for many. Google, BlackBerry, Apple and several other giants have outlined their in-car assistant programs, some are already available in newer models, and it can only be a matter of time before the kids watch Netflix in the back while you get some work done on the long drive to the campsite for a summer break.

With the Internet of Things becoming a tangible reality in the near future, the possibilities exist for a convergence of intelligent agents that could see your fridge knowing its contents and referencing your calendar to see if you have any dinner recipes planned, for which you require ingredients. Our televisions will use biometric technology to recognise our voices and display the programs we prefer to watch, while GPS sensors in our cars and devices will tell our automated home systems when we'll be home and set the temperature accordingly.

If bathroom technology continues to advance, then an assistant might run a warm bath when it knows we've been caught in the rain. But rather than a single, unified experience, it seems likely that companies will want you to sign up to their own brand of this brave new world. The future won't be quite as egalitarian as we'd have hoped.

"From their perspective, it gives you an allegiance to that brand or company," says John Smith, "so when you replace your television you'll go with the company that are already set up on your mobile phone. At the moment we're spending a lot of time with organisations changing the interface voices for them to differentiate their service".

Nuance is in a good position to watch these developments, as the company licenses technology to companies including Apple, Microsoft and Samsung, among others.

"It's going to be difficult," says Smith. "At the moment, it's different people wanting to do different things. I see it as having this information sitting in the middle and people being able to access it. I don't see any time in the future where we're going to get a common set of APIs that will allow us access. I don't think any of us would trust anybody with sole control of that.

"We've been looking at the Internet of Things, for example, about the amount of data that we've got, and the amount we're willing to share. Who owns it? Who aggregates it? We're very suspicious, and even more so recently, because of what's gone on about data being leaked; the NSA; and all these sorts of things. The governments can't be trusted with this information in the eyes of most people, so who'd we trust? Would you trust Apple? It depends on your allegiance." ☒



THE BATTLE OF THE DIGITAL ASSISTANTS

Cortana, Siri and Google Now – each of today's digital assistants has its own strengths and weaknesses, but which is best? [Mark Hachman](#) investigates...

The personal computer has endured for more than 30 years. It's a mature technology. But smartphone digital assistants – the new breed of data butlers designed to make our lives simpler – have yet to climb out of their cribs.

The perfect digital assistant would anticipate our every need, retrieving answers from search engines, connecting us with our social networks, and tapping into maps and calendars to guide our travel and appointments. So far, no single digital assistant has figured out how to connect all the dots effectively and intuitively.

The three big names in the field are Microsoft's Cortana, Apple's Siri, and Google Now. We expect these services to evolve from helpful librarians to full-fledged personal concierges. All of them do an admirable job of responding to queries, but they don't yet anticipate what we might need to know next.

Just the facts, ma'am

To test the three services, we quizzed each assistant on a variety of general facts and calculations. Then we asked them to perform nearly 40 common smartphone operations, and scored each one on accuracy of results and elegance of operation.

We awarded two points if an assistant provided simple search results, and

three points if it responded orally and/or displayed a 'card' with an image and further information. We also awarded a bonus half-point if an assistant completed any task especially well. If it couldn't provide any helpful response, it got a zero.

How did our three contenders perform? Here's the short version. In our sister title, PC World's tests, Google Now scored 101 points, Siri scored 97 points, and Cortana came in last with a score of 87 (for the long version, visit tinyurl.com/q832LyL).

But numerical scores only tell part of the story. One key feature of a digital assistant is how well it anticipates what you want before you want it. At this point Siri lacks the intuitive powers of Google Now and Cortana. This shortcoming puts it at the bottom of the heap, despite its silver-medal showing in the task-based tests.

Let's take a closer look at each service.

Cortana: impressive debut

Cortana, the digital assistant built into Windows Phone 8.1, is packed with possibility. But it's still a beta product, and not a miracle worker. With Cortana, Microsoft seems to be channelling Google Now, as the features of the two interfaces overlap.

To access Cortana, tap its Live Tile or hold down the Search button. Unlike the other two

bing
web local image
Directions to Seattle, WA
10 hrs 54 mins, 753.4 mi
Driving Distance from Sacramento, CA to Seattle, WA
www.travelmath.com/.../Sacramento,+CA
How far is it to drive from Sacramento, California to Seattle, Washington? View a map with the driving distance between Sacramento.
how far is it from Sacramento to Seattle

CORTANA presents visually robust results for map information and can search your phone, but not your OneDrive account

assistants, it will ask for your name and how to pronounce it.

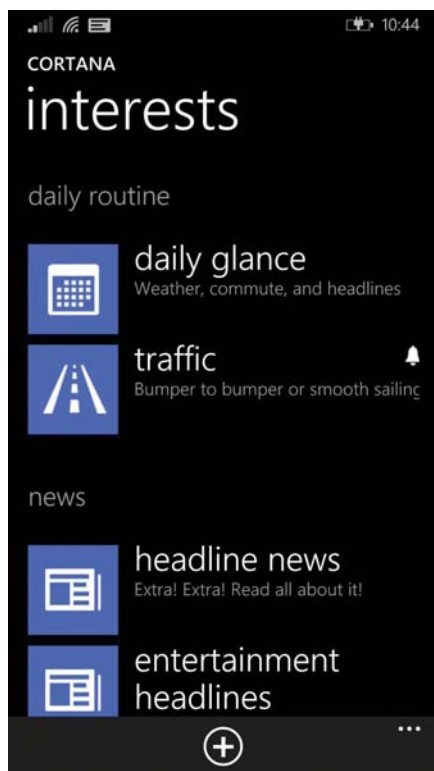
The first time you use it, Cortana will also ask for permission to access your email, People, and contacts, as well as your location and even your Facebook account. For the full-fat Cortana experience, answer yes.

“ We expect these services to evolve and blossom over time from helpful librarians to full-fledged personal concierges ”

Next, Cortana will ask some personal questions so it can set your initial “interests” – topics it will research for you. The results appear when you launch the app. Below the spinning circle icon, you’ll see a ‘daily glance’ of news headlines Cortana has taken from your interests. The top news snippet tends to appear in the Cortana Live Tile.

You can add interests, although the choices are limited. Take your pick from: Daily Routine (traffic and a daily glance at the headlines), News (all sorts of topics), Eat + Drink (meal suggestions), Travel (a trip planner) and Weather.

Cortana will also figure out where you live and work – this means the locations you frequent on weekdays and on weekends – and adjust its suggestions accordingly.



CORTANA will monitor a list of interests – you can tweak these or add even more

The easiest way to access Cortana is via the Search button. Certain queries generate an attractive “card,” including an oral response, an image, and some additional explanation. Cortana can search contacts, music, and documents stored on the phone – but it can’t search your OneDrive account.

Although Cortana handled everything we threw at it pretty well, we encountered some inexplicable omissions. It couldn’t send a contact via email during our hands-on testing. Nor could it give us details on an airline flight or take a picture using the device’s camera. Puzzlingly, the latter request generated a page of search results.

Ordering Cortana to call your local Pizza Express won’t work unless you’ve already saved the relevant phone number to your contacts. Both Siri and Google Now search for the number in the background and call the closest location. Cortana’s beta status manifests itself in quirks like these.

You can tell Cortana to listen to and identify a song. It’ll even match it to a track in your collection or in the Xbox Music store.

Cortana also includes a few nifty features that don’t appear to be available in Google Now – Quiet Hours and an Inner Circle of friends. (Apple includes similar capabilities in its Do Not Disturb settings.)

You can set a time (after 11pm, for example) when Cortana will intercept a call so you’re not disturbed. It’s convenient for bedtime or critical business meetings. But Cortana allows calls from your Inner Circle and repeated calls (which may indicate emergencies) to break through.

Siri: a tad limited

Siri’s shortcomings have become part of the national zeitgeist (they even got a mention in a *Simpsons* parody). But iOS 7 reportedly improved Siri, and in our extensive tests we found that it more than held its own.

In terms of supplying facts, Siri shines, combining accurate responses with deeper information, especially when it taps online maths engine Wolfram Alpha for its answers.

When you ask more complicated questions, Siri generally defaults to a list of search results. Often the answer was readily apparent. But with interpretive-style questions such as “How long does it take light to travel to the Earth from the Sun?” Siri regularly failed to provide any coherent results, which was a disappointment.



Siri manages to handle a wide range of BASIC QUERIES with tremendous aplomb

Siri also lacked sophistication in handling common tasks. For example, it doesn’t have geofencing capabilities, so when we asked it to remind us to buy eggs and milk at the grocery store, it set up a generic reminder rather than keying our request to a specific location (the local supermarket).

On the other hand, Siri does do quite a few things other services can’t handle (tinyurl.com/ntcnL6x): Say: “Read me my email,” and Siri complies. Command: “Turn on Bluetooth,” and Siri dives into the settings menu. Ask: “What’s going on?” and Siri lists trending topics on Twitter. Impressive stuff.

Siri’s greatest weakness is that it does what you tell it to do, and little more. It’s good at pinging you with reminders you set, but it won’t step in to let you know your flight is late. On the other hand, you can turn to iOS apps to fill that gap.

YouTube, for example, sometimes pings me about a new video I might be interested in. And Siri, unlike its competitors, can smoothly post to Twitter and Facebook.

Google Now: still the best

Google Now launched with Android 4.1 in July 2012 and has only improved with age. It has broadened its reach, from tracking packages to providing travel reminders. It doesn’t thrust itself into your face, demanding attention. If anything, its subtle approach is one of the highlights, but you sometimes need to dig a bit to find all it has to offer.

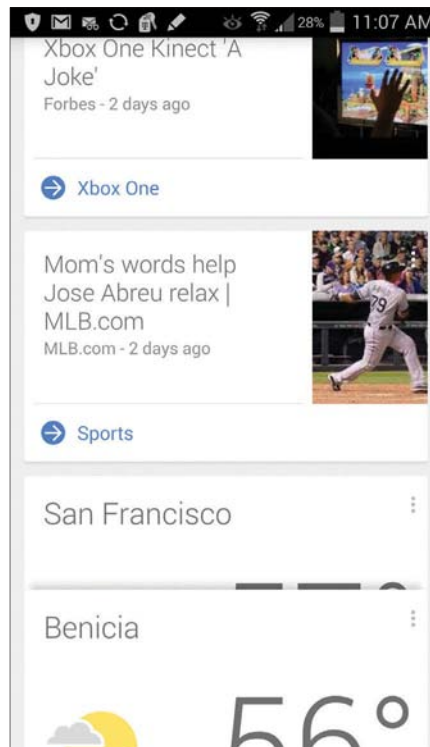
“All three services will continue to evolve, and all three have unique talents. For now, Google Now sets the bar”



Google Now's strength lies in proactive notifications – it practically invented them. Its weakness is that it has to contend with the seemingly infinite variety of Android phone models, as well as the many permutations of Google's operating system and apps.

The digital assistant actually consists of two separate services: Voice Search and Google Now. Voice Search is the command centre. By tapping the microphone in the Google search widget, you can command your Android device to call a friend, navigate to a location, ask a question, set a reminder, play music, or perform a Web search.

To enable Google Now, swipe up in the lock screen or from the bottom of your device's screen. If you haven't used the assistant before, it will ask you to define what cards it should present. This isn't as daunting as it



GOOGLE NOW offers a collection of fact-based cards you can browse through

sounds as the initial list is quite small and manageable. Choose from cards about traffic, weather, public transit and much more.

The great thing about Google Now is it often anticipates your questions. In fact, it can be a bit overzealous about predicting what you'll want to see next. For example, if you once searched for a local Thai restaurant, a card may occasionally pop up telling you how long it will take to get there.

Search once for the score of an England game, and Google Now assumes you'll want to monitor the team's activity going forward.

Once you've configured Google Now, you can swipe down through the cards. On each card, you'll find an options menu at the upper right, where you can, for instance, hide sports scores to avoid spoilers, or filter out updates from a particular website.

Overall, Google Now does an excellent job of answering a wide selection of questions thrown at it, almost always responding to them quickly and directly with a card.

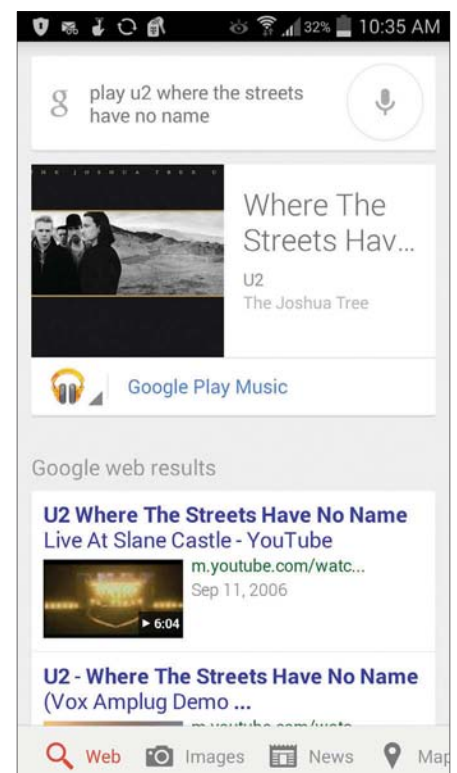
Google Now also excels when it comes to setting reminders for upcoming events based on your location and the content of your email messages. It mines your email and calendar for your next appointment, determining when it is, checking traffic, and calculating when you need to leave. Now that's what we call integration.

An evolving field

This snapshot of the current state of digital assistants is far from the final word. All three services will continue to evolve, and all three have unique talents. For now, Google Now sets the bar. Microsoft's Cortana makes a valiant effort, but needs to improve in some areas, such as Facebook and Twitter integration. And if Apple builds some predictive capabilities into Siri, its digital assistant could retake the lead. ☒



Siri is the only assistant (out of the three) at the moment that can **RELIABLY POST** your messages to **TWITTER** and **FACEBOOK** by using voice commands



A request to play a certain song yields options in **GOOGLE PLAY MUSIC** (your cloud storage locker) and YouTube

BEST TRAVEL

Heading off on holiday this summer? We've rounded up the best accessories and gadgets that will make your time away even more enjoyable

Holidays are usually a good a good time to turn off the electronics and switch off for a while. But there's still a place for gadgets on the beach, by the pool or at a festival: you can relax reading an ebook, listen to some tunes via a Bluetooth speaker or monitor that early morning run with an activity tracker.

Whatever your plans, here's a fantastic selection of kit including accessories that will complement your existing gear - USB chargers, laptop backpacks, waterproof pouches and more...



GADGETS

BEST ACTIVITY TRACKER

Fitbit One

Rating: ★★★★★

Price: £70 inc VAT

Buy from: amazon.co.uk

If you want to get active but need a little motivation, the Fitbit One will do the job. It tracks your steps, sleep and calories – all for a sensible price. Better still, it's accurate, lasts around two weeks between charges and has a built-in clock and alarm. It also lets you compete with your friends, giving you even more motivation. The proprietary charging cable is a pain, but it's a minor quibble about what it otherwise an excellent activity tracker.

Full review: tinyurl.com/keq7zhc

ALSO CONSIDER: Jawbone Up24 (£125), Fitbit Flex (£70)



BEST LAPTOP AND TECH BACKPACK

Wenger laptop backpack (SA1932)

Rating: ★★★★★

Price: £60 inc VAT

Buy from: amazon.co.uk

A rucksack these days isn't just full of socks, T-shirts and books. It also has to protect your tech while you travel through crowded airports and rough terrain. Laptops and Ultrabooks mean you can carry your computer around with you with ease, but comfort must be married to robust protection from knocks and drops.

The Wenger laptop backpack (SA1932) is one of the best laptop backpacks we've seen. It has buckets of space, padded in all the right places for comfort and gadget protection. There are side pockets for chargers, extra batteries, cables, and so on, as well as a special iPod/MP3 player pocket in the second large compartment with a headphone cable exit point in the centre. Its adjustable shoulder straps make it easy to pull on or off in a hurry. It's particularly well made for 15in laptops and tablets, plus has pockets for your smartphone and cables, too. We customised our further by adding a smaller laptop sleeve from Brenthaven for double protection.

Full review: tinyurl.com/ptaamms

ALSO CONSIDER: Thule Crossover Backpack for 17in laptops (£90)





BEST TRAVEL WALLET

Bellroy Travel Wallet

Rating: ★★★★★

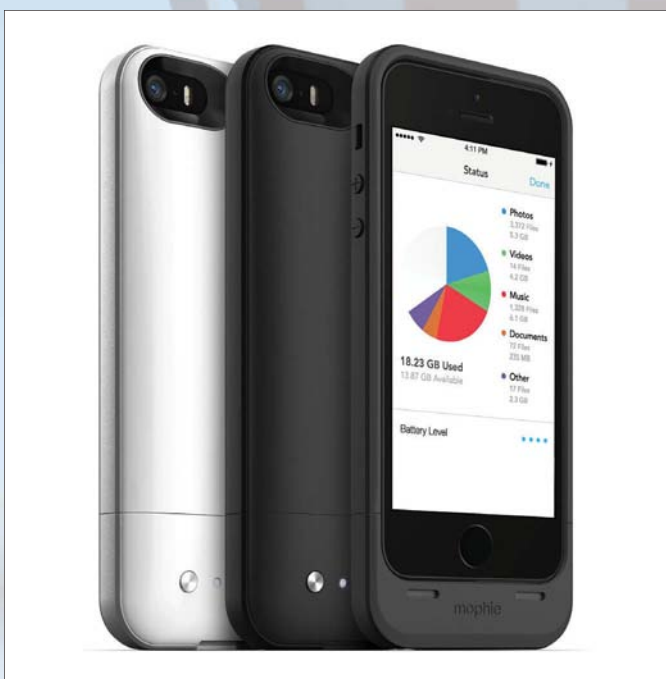
Price: £89 inc VAT

Buy from: bellroy.com

While the Bellroy Travel Wallet isn't really 'tech', it's so cool that we've bestowed Geek status on it. While most of the gear we recommend for travel here will be eyed with suspicion by airport security, the Bellroy Travel Wallet will delight airline check-in, staff, customs, your fellow travellers and you.

It has all the usual sections and slots you'd expect of a modern-day wallet, and a brilliant easy-access pocket that holds your passport. There are sections for different currencies and it will hold long boarding passes without folding or creasing. There's even a tiny Biro for filling out those visa and customs cards.

Full review: tinyurl.com/q5nb9cs



BEST IPHONE BATTERY CASE FOR TRAVEL

Mophie Space Pack 32GB

Rating: ★★★★★

Price: £139 inc VAT

Buy from: mophie.com

While travelling, you'll be faced with a dual attack on your smartphone's battery life: you're using your phone more, and are away from a power socket for hours or even days. The answer is a battery case for your phone that can keep you going for longer and protect your precious phone from the rigours of travel.

There are a bunch of great offerings available, but for travellers we're going to recommend Mophie's Space Pack as it offers more than just a full recharge. The Space Pack includes additional storage, which is invaluable if you want to load a few movies and take a bunch of photos and videos of your travels.

The extra storage (16GB or 32GB) is controlled via an app, and works best if you transfer your bigger files from your phone to the case, and save photos there either directly or at the end of the day.

Full review: tinyurl.com/onmLn7q

ALSO CONSIDER: Mophie Juice Pack Air (£90), PhoneSuit Elite 5 (£75)



BEST BATTERY PACK

Mophie Juice Pack Powerstation Pro

Rating: ★★★★★

Price: £89 inc VAT

Buy from: mophie.com

Don't run out of power when you need it most. Invest in a lightweight power brick that you can use to recharge fading batteries on your smartphone or tablet. The Powerstation Pro offers 6000mAh power, is lightweight enough to live in your bag and provides a charge when necessary without bulking up the iPhone itself. It's robust - with an impact and splash-resistant casing that makes it as rugged as the mountain you might climb up with it. The battery charger is IP65 rated, so it's dust and water resistant when its ports are closed. That's resistant to water being sprayed at it, but not fully waterproof, mind.

Full review: tinyurl.com/pnhdxs8

ALSO CONSIDER: Phonesuit Flex Micro (£60)



BEST NOISE-CANCELLING HEADPHONES

Bose QC20

Rating: ★★★★★

Price: £239 inc VAT

Buy from: bose.co.uk

Headphones are a pretty essential tech travel item, but ones with noise-cancelling technology are particularly handy when you're on the go or on holiday. Whether you're travelling by train or plane, the headphones will cut out all the annoying background noise such as droning engines, people talking and babies crying. These are one of the most comfortable pairs of in-ear headphones we've tested, too, so will be great for long listening periods.

Not only are they comfortable and great at cutting out unwanted background noise, the headphones have a unique 'aware mode', which you can switch on and off at the touch of a button. This allows a certain amount of background audio through, so you don't miss important announcements such as your flight boarding.

Full review: tinyurl.com/q44b8xt

BEST HEADPHONES

Bowers & Wilkins P3

Rating: ★★★★★

Price: £125 inc VAT

Buy from: bowers-wilkins.co.uk



Whether you're holidaying close to home or travelling further afield, you're going to want some decent headphones to accompany you. Bowers & Wilkins make high-end and respected audio products, and that typically means a matching price tag. However, the P3 headphones can be yours for a little over the £100 mark. Even at this affordable price, they ooze class and offer good sound quality.

They also fold down and into a compact carry case, which makes them even better for travelling. Last but, by no means least, the P3s offer a natural and balanced sound quality from the 30mm drivers. The sound is nicely non-intrusive, particularly good in the mid-range and not too bass heavy.

Full review: tinyurl.com/pzo7pon

ALSO CONSIDER: Keff M500 (£250), Philips Cityscape Downtown (£75) and MeElectronics Atlas Orion (£59)

BEST OFFLINE MAPS

Google Maps

Rating: ★★★★★

Price: Free

Buy from: google.co.uk



Google Maps is a great app, but is next to useless when you can't get online or have no data connection. Therefore, before you go travelling search the area(s) you'll be visiting and once these are onscreen, type 'ok maps' into the search bar to save that part of Google Maps. Alternatively, pull up the place info sheet from the bottom of the screen and select 'Save' which has a star icon. This way you can ensure you'll be able to navigate around without paying for data.

Full review: tinyurl.com/mbe4L82

ALSO CONSIDER: City Maps 2Go (£1.99)



BEST NEW GADGET

Netamo JUNE

Rating: N/A

Current street price: £58 inc VAT

Buy from: netamo.com

Netamo's JUNE is a new entry into the wearable tech market, but it's very different from the other gadgets available. Aimed at women with a diamond-like appearance, the device can be worn as a bracelet or brooch and is designed to measure your exposure to the sun, making it ideal for travelling.

It works with an app that can show you real-time advice on how to protect yourself from the sun, including which SPF cream you should be using for the current UV levels.

JUNE is available in gold, platinum or gold metal, and there's the option of a leather or premium silicon wrapband for your wrist.



BEST TRAVEL IPAD CASE

Apple iPad Smart Case

Rating: ★★★★★

Price: From £39 inc VAT

Buy from: store.apple.com/uk

It didn't take us long to decide which iPad case we think is best. Available for the iPad Air, iPad mini and the iPad 2/3/4, Apple's iPad Smart Case is a perfect fit, with precision cutouts for the speaker, camera, rear microphone and headphone socket. Unlike most cases, it completely covers the iPad when it's closed. There are no large gaps for the speakers or top edge, and the front cover is held closed by magnets. These also serve to turn the iPad on and off when you open and close it. Best of all, the case is very lightweight and adds minimal bulk to the iPad Air. The only downside is the price. For the iPad Air Smart Case, you'll have to fork out £65, or £55 for the iPad mini. But if you've got a second- third- or fourth-generation iPad it'll only cost you £39, which we think is great value.

Full review: tinyurl.com/kxqm392

ALSO CONSIDER: Everything Tablet 360 Rotating Case (from £19.99), Twelve South BookBook Travel Journal (£89)



BEST TRAVEL APPS

Triposo

Rating: ★★★★★

Price: Free

Buy from: Google Play Store or iOS App Store

Triposo makes apps that will help you plan your visit to pretty much any country in the world, and will assist you while you're there, too. Use them to find out what's nearby, so you can plan the activities you'll get up to while you're there. For example, if you're planning to travel to Italy, you can download Triposo's Italy Travel Guide (it's free) to find out what there is to do in the city you're going to visit, such as Rome, Florence or Venice. You'll find maps with highlighted attractions, restaurants, bars, supermarkets and photo opportunities, as well as information including directions reviews and contact details for restaurants, museums and more. Other handy features include a phrasebook and currency converter.

Full review: tinyurl.com/o6xtz7u

ALSO CONSIDER: Kayak (free), TripCase (free)



BEST PHOTOGRAPHY GADGET

Eye-Fi Mobi Wireless SDHC card for digital cameras

Price: £33, 8GB; £47, 16GB; £70, 32GB (all prices inc VAT)

Rating: N/A

Buy from: amazon.co.uk

If you don't already have Wi-Fi built into your digital camera, then the Eye-Fi Mobi card is the answer. It comes in 8GB, 16GB or 32GB sizes, and is compatible with most cameras that record onto SD cards.

Eye-Fi Mobi means you can send your photos wirelessly and near instantly to a smartphone or tablet (it also works with laptops and PCs, but you're unlikely to be travelling with a PC).

The benefits are obvious: you can quickly check the photo on a larger screen, edit it and then share it on Facebook or email it to someone without having to remove the card from your camera

or try and connect it your smartphone or tablet. Plus, it's also an automatic backup of your images. Setup is simple and although pricier than a standard SD card, the Eye-Fi Mobi is a great addition to any travel photographer's bag.



BEST WATERPROOF CAMERA/ACTION CAMERA

GoPro HD Hero 3

Rating: ★★★★★

Price: £360 inc vat

Buy from: amazon.co.uk

After trying the GoPro for various activities, including mountain biking and ice skating, we could see why the GoPro name is almost synonymous with the action camera concept. We'd like to see a helmet strap in the box as standard, but image quality is good in a variety of conditions, the design is reassuringly rugged, and the Wi-Fi controls make operating a camcorder that may be attached to your clothing or a vehicle very friendly. If you have a compatible smartphone you can use its screen as a viewfinder.

ALSO CONSIDER: GoClever DVR Sport Gold (£99)



BEST eREADER

Amazon Kindle Paperwhite (2013)

Rating: ★★★★★

Price: £109 inc VAT

Buy from: amazon.co.uk

Amazon tweaked its original Paperwhite eReader with a better screen, faster processor and some new features for the latest model. Although you can read ebooks on a tablet, a dedicated eReader is still the best choice for bookworms. The screen is a delight to use, even in bright sunlight, and the backlight means you can keep reading at night. It isn't the cheapest eReader around, but if you can afford it, you won't be disappointed. However, it's worth checking out the £49 Nook GlowLight (tinyurl.com/d44cfqj) and associated book store before taking the plunge.

Full review: tinyurl.com/m4zrs78

ALSO CONSIDER: Nook Simple Touch GlowLight (£49)





BEST FESTIVAL GADGETS

Lumsing 10400mAh Power Bank

Rating: ★★★★★

Price: £18 inc VAT

Buy from: amazon.co.uk

Lumsing's Power Bank is a must-have for festival-goers and campers this summer, allowing you to charge your smartphone, tablet, camera and any other 5V USB-powered device wherever you are. Inside this 159g, harmonica-style device is a Grade A Samsung lithium-ion cell specified at 10,400mAh, which should be good to charge your smartphone four- to five times. You'll be able to charge a tablet, such as an iPad, from empty to almost full once before the Power Bank is depleted. Twin outputs let you simultaneously charge two devices, one supplies 1A for smartphones, and the other 2.1A for tablets. There are also four LEDs, so you can check at a glance how much power is left.

Full review: tinyurl.com/mgo3926

ALSO CONSIDER: Inngie PocketCell (£70)



Streetwise SWHS 12V ceramic straighteners

Rating: N/A

Price: £7.25 inc VAT

Buy from: amazon.co.uk

It's not strictly tech, but the Streetwise SWHS is one gadget we couldn't possibly camp without. Costing a tiny £7.25 at Amazon, you expect these ceramic straighteners to be rubbish. You would be amazed. GHDs they are not, but the Streetwise SWHS gets usefully hot surprisingly fast, and unlike many cheap straighteners they won't rip out your hair. A 12V connector means you needn't be anywhere near the mains electricity supply to use them - just be sure not to leave them switched on and drain the car's battery (maybe take some jump leads if you're the forgetful sort).

ALSO CONSIDER: BaByliss' 2851BU pro Cordless Straightener (£20)



I-Box Twist

Rating: ★★★★★

Price: £50 inc vat

Buy from: amazon.co.uk

This quirky-looking Bluetooth speaker is made by British manufacturer I-Box. It's much louder than you'd expect and fairly light, too. Okay, so there are more compact travel speakers available, but this is a good compromise on size, weight, price and battery life. It also works as a hands-free kit for phone calls thanks to a built-in noise-cancelling microphone.

We were surprised at both the quality and loudness of the Twist. It has two 38mm drivers on the right-hand side and a passive bass 'radiator' behind them, with its own grille. Battery life isn't the best - around five hours - but it's probably enough for most people. It's hard to fault the I-Box Twist given how cheaply it can be picked up online.

Full review: tinyurl.com/Let9rdf

ALSO CONSIDER: Bose SoundLink II (£249), Maxell MXSP-BT03 (£45)

AMD

VS

Intel

There are hundreds of processors to choose between, leading to a lot of confusion about what's best for your next computer. Roland Waddilove examines the options

There was a time when choosing the right processor for your laptop or desktop computer was straightforward. There was a choice of perhaps half a dozen models from Intel or a similar number from AMD, but CPUs have bred faster than rabbits. Visit ark.intel.com, and in the processor section, in just the current 4th Generation CPU subsections, are 42x Core i7, 51x Core i5 and 30x Core i3 CPUs. That's 123 different processors and some PCs still come with older third generation Core i3, i5 and i7s, of which there are another 78. That's over 200 processors from Intel. AMD isn't any better and in the notebook and desktop processor sections at products.amd.com/pages are over 400 CPUs.

Intel® ARK	
Intel® Core™ i5-4690T Processor (6M Cache, up to 3.50 GHz)	
SPECIFICATIONS	
Essentials	
STATUS	Launched
LAUNCH DATE ?	Q2'14
PROCESSOR NUMBER	i5-4690T
# OF CORES ?	4
# OF THREADS ?	4
CLOCK SPEED ?	2.5 GHz
MAX TURBO FREQUENCY ?	3.5 GHz
CACHE	6 MB
SYSTEM BUS	5 GT/s
# OF QPI LINKS ?	0
INSTRUCTION SET ?	64-bit

SPEC LIST Intel ARK is an up-to-date database (and app) of Intel processors

With over 600 processors available from Intel and AMD, it's an impossible task to try and choose one. Even if you could pick one from the 600 that are on offer, could you find a desktop PC or laptop that has it? You'd probably struggle. When buying a new computer, you can't start by selecting a processor. What you must do is come up with a shortlist of computers you like - and then try to work out which CPUs they have and which might suite you the best.

If you're shopping online, use the Intel and AMD websites to check the processor specifications of computers you're interested in. If you're shopping on the high street, Intel ARK for Android (tinyurl.com/qzyh9hq) and iOS (tinyurl.com/odj3mu3) provides the processor information you need. If you see a PC you like, you can look up the CPU specs in the app before making your choice at the till.

Dual- and quad-core chips

There are three main processor families from Intel and these are Core i3, Core i5 and Core i7. As a general rule of thumb, these are in order of increasing power and price, so a Core i7 is more expensive, but more powerful than a Core i5, which in turn is more expensive and powerful than a Core i3. There is some overlap between the families though and you might be better off with a top-of-the-range Core i5 than a bottom-of-the-range Core i7, for example.

Processor capabilities and power within each of these types of families varies and after choosing whether to go for an i3, i5 or i7, you should consider the number of cores.

Each core is a processor unit and having more cores enables a computer to multitask more easily. Some programs can allocate different tasks to different cores and so perform several simultaneously. More cores mean faster, more responsive software.

All Core i3 processors have two cores. Core i5 and Core i7 processors can have two or four cores - and four-core CPUs perform better under heavy loads. Be sure to check the number of cores when buying a PC.

Hyper-Threading

An Intel technology called Hyper-Threading enables one core to appear to be two; two cores to look like four; and four to be eight.

Virtual cores aren't as good as real ones, but they enable a processor to make more efficient use of its power. Although Core i7 processors only have four cores like many Core i5s, most are able to run eight threads (eight virtual cores) compared to the Core i5's four. This is one way in which Core i7 processors are better than Core i5s.

Be sure to check the number of threads a CPU can run when buying a PC.

NUMBER CRUNCHER Intel's Core i7 is the most powerful version of their CPUs

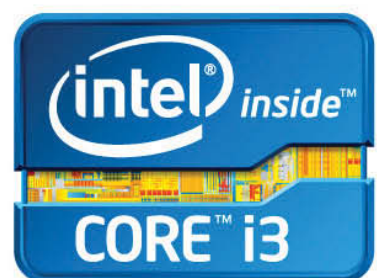
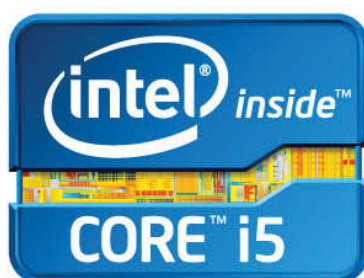
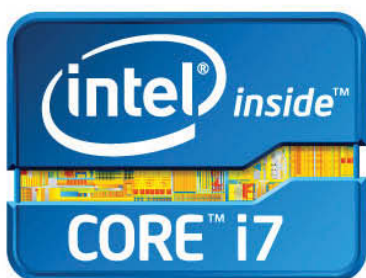


Cache

Processors contain on-board memory called a cache and this is used to store frequently accessed data. It can be accessed much more quickly than the main RAM in the computer and the larger the cache, the more information a processor can store in it. This means it needs to access slower main memory less often, and a CPU with a bigger cache functions more efficiently than one with a smaller cache.

Core i3 processors have 3MB or 4MB of cache and the ones with 4MB should be a tiny bit faster. Core i5 processors have 3MB, 4MB or 6MB caches. If all other factors are equal, Core i5 CPUs with 6MB perform better than those with 3MB or 4MB. Core i7 processors can have 4, 6 or 8MB caches and the increased cache size is another way in which the Core i7 is better than the Core i5.

There are some Core i7's with two cores and 3MB of cache, but some Core i5s with four cores and 6MB of cache. This why some Core i5's can be better than some Core i7s. Don't assume a Core i7 is best.



BUDGET OPTION Packard Bell Easynote TE69 with 1.8GHz Intel Core i3-3217U dual-core processor and integrated Intel HD Graphics 4000

Clock speed and turbo mode

At one time, processors had a fixed clock speed and they ran at a constant speed. These days CPUs are more like the engine in a car. They idle at rest and run at moderate revs during normal use. When you need the power, you can floor the accelerator and rev to the red line. Processors are similar and they idle at less than 1GHz, but give them work to do and they run at 2GHz, and when needed they can accelerate to over 3GHz.

A CPU's clock speed is an indication of the speed when running normally, but some models have a turbo mode which allows them to exceed this for short periods where extra processing power is needed. Processors with high clock speeds are best, but those with a turbo mode are better. When comparing processor speeds, check whether it's the clock speed it can run at all day or whether the figure is the turbo speed it can reach only briefly.

Intel graphics

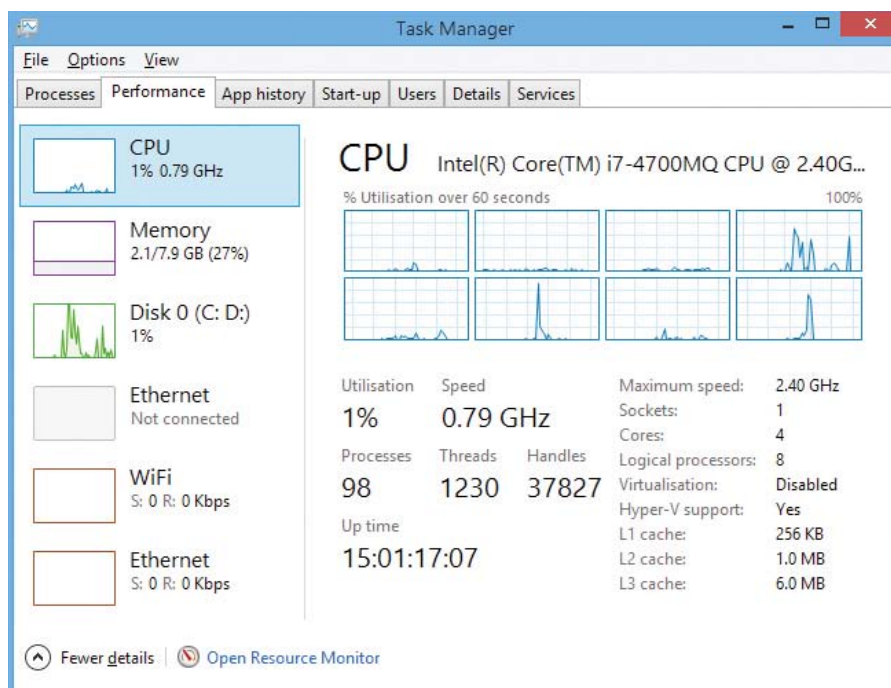
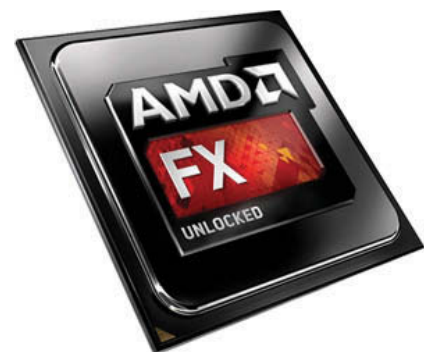
Nearly all of Intel's processors come with integrated graphics. There's Intel HD Graphics 4200, 4400, 4600 and 5000, and Intel Iris Graphics 5100 and 5200. Higher numbers mean better performance, so if two CPUs are the same in all other respects, the

one with the higher graphics number will offer better performance. This clearly doesn't matter if the PC has a separate graphics card.

Budget PCs tend to use the on-board Intel graphics and top-end PCs have a dedicated high performance graphics card, so this is only really an issue for lower-priced PCs.

AMD processors


Most of this article has been about Intel processors and this is partly because they



LOW-END CHIP AMD CPUs are most common at the budget end of the market

have the largest market share and partly because they have the best processors.

AMD was a serious challenger at one time, but, these days, it only competes at the budget end of the market. Everything we've said applies equally to AMD CPUs though, so more cores means better multitasking, bigger caches mean better performance, and some have a base speed (normal running) and boost speed (while in turbo mode).

It's difficult to compare AMD processors with Intel's because frequently there are many other differences between PCs, such as the motherboard, video card, RAM, disk drive and so on. Some AMD processors to look out for include the AMD A10-7700K, AMD A8-6600K and AMD Athlon X4 750K in budget PCs, and the powerful and versatile AMD FX-4300 in slightly better ones. 

SPEED TEST Chips have standard speeds and can accelerate to turbo speeds for a while. This Core i7 is idling at 0.79GHz, runs at 2.4GHz, but can turbo up to 3.4GHz



YOUR QUESTIONS ANSWERED

Expert computing advice

We tackle readers' hardware and software conundrums

CORRUPT ATTRIBUTE RECORDS

Q My Windows 7 PC boots perfectly for a short time, but then boot times gradually become slower and slower until the computer eventually displays a black screen on boot up and begins to show messages that read: "deleting corrupt attribute records". This lasts for around 20 minutes before the machine finally boots. All is then fine for a few weeks until the boot times start slowing down again.

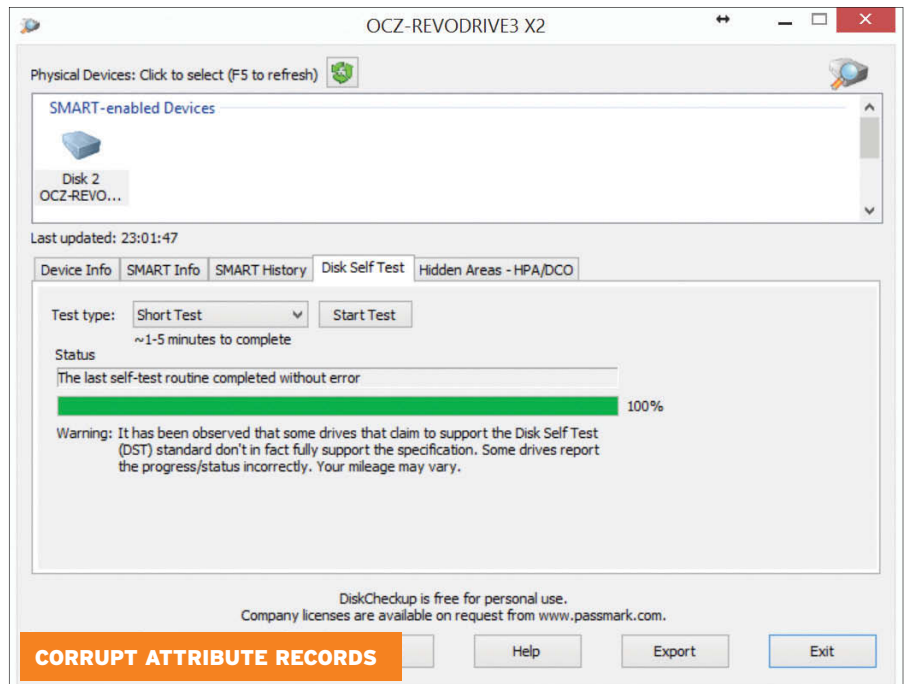
I use IObit Advanced System Care, which always finds and corrects Registry errors, but I don't believe this is relevant. What should I do?

This looks as though your hard drive is nearing the end of its useful life and is due for replacement. Each time you see the message 'deleting corrupt attribute records', Windows is fixing errors on your hard drive, but it's not repairing any physical damage to the hardware of the drive itself. This means more errors will eventually occur, causing further data corruption, which Windows then has to fix. Eventually, you may end up with errors that can't be fixed and which may cause you to lose data.

If you don't have one already, we suggest making a full system backup as soon as possible. If you have no backup software installed, you can use Windows' built-in System Image Backup. Otherwise we'd recommend a tool such as Macrium Reflect Free edition from macrium.com, which can quickly and easily make a complete backup of your PC's hard disk to an external drive. It also makes it simple to copy this image back to a new hard drive should you need to replace your existing one.

Before throwing the drive out, it's worth carrying out some tests. The simplest of these would be to check the drive's built-in Self-Monitoring, Analysis and Reporting Technology (SMART) status.

Sometimes, the tools to do this are provided with your hard drive. If not, you can download software such as PassMark DiskCheckup to run some diagnostic tests on your drive. For this to work, both your PC's BIOS and drive will need to support SMART (most do), and you'll need to have



the feature enabled in the BIOS, which it normally is by default.

If no hardware errors can be found, it's possible that some software is causing the corruption of your drive. Improper shutdowns are another possibility, although these would need further in-depth analysis of your PC to diagnose properly.

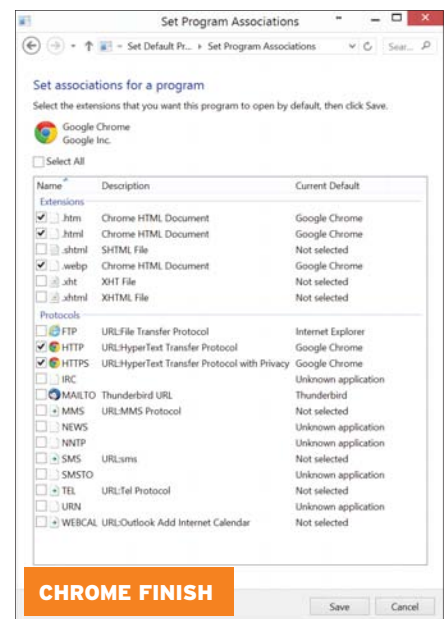
CHROME FINISH

Q I don't like Chrome and never intentionally use it. However, it has installed itself as the default browser, so that accessing the internet from a site under Firefox always uses Chrome. There is one instance where I must use Chrome and so I can't just delete it. Where can I reset my computer to always use Firefox?

Start up Firefox and click on the icon comprised of three horizontal lines over in the top-right corner of the window. This will bring up a small menu of icons from which you can select 'Options'.

From the Options dialog box, select the gearwheel icon labelled 'Advanced'. Now click the button at the bottom, marked 'Make Firefox the default browser' and tick

the box marked 'Always check to see if Firefox is the default browser on startup'. Now click OK. Next, start Chrome, type **chrome://settings** into the address bar and then press Enter. Under Default browser, you should see that Firefox has been set as the default web browser.



If this doesn't fix your problem. Go to the Windows control panel and click on 'Default Programs', then 'Set your default programs', and click on the Google Chrome icon in the left-hand pane.

Next, click on 'Choose defaults for this program'. This will bring up a list of all the protocols and file types that can be opened with Chrome. If you deselect all of these options and click Save, Chrome shouldn't run any more unless you explicitly choose for it to do so.

PRINTING ON CARD

Q I'm trying to print a set of wedding place name cards on thin card, but am having trouble getting the card to pass through the printer. Sometimes it works, at others it doesn't. I know the obvious answer is to use thinner card, but I have already purchased all my card. My printer is an HP DeskJet 2050. Do you have any thoughts?

The first thing to check is that the weight of card stock you are using is within the specified limit of the printer. Sometimes printers have more than one paper tray and the maximum thickness of card supported can be different for individual trays, so even if your printer supports the thickness you have selected, you may not be able to just put it in your main paper tray like you would a stack of A4 sheets.

If you have a manual feed option, this is often the most tolerant of thicker stock as it requires less bending of the card and often allows a flat, 'straight through' path rather than following a U-shaped curve through the printer.

Printers are often able to automatically detect the type of paper you're using and configure the printer accordingly, especially if you're using official papers supplied by the printer manufacturer. In other cases, you may need to take a few steps to set it up yourself.

When printing, look for options that allow you to select the media type. If no card options are available, try looking for an envelope mode. Combining the thickest available media type selection with using the manual feed tray is your best chance of printing on your thick card.

SCREEN RESOLUTIONS

Q I want to take advantage of the full resolution of a WQHD monitor (2560x1440) by connecting a laptop via DVI or HDMI. Does the laptop I use need to have the same WQHD maximum screen resolution capability or will that resolution be available once I've connected to the monitor?

Your laptop's built-in screen doesn't need to match the pixel resolution of your connected external monitor, but its internal graphics hardware does need to be capable of supporting that resolution.

Continues >>

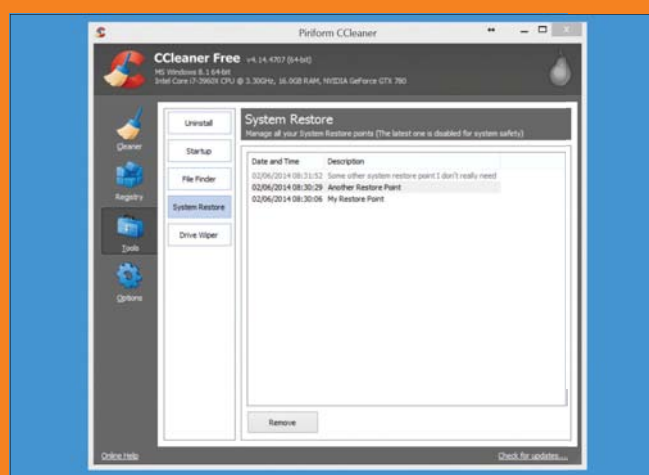
DELETE AN INDIVIDUAL SYSTEM RESTORE POINT

System Restore is one the most useful features of Windows. As part of Windows System Protection, it can resurrect a PC that's stopped working, by returning it to a state when it was known to be working. These states are known as system restore points and can be created automatically during software installations or configuration changes, or manually by the user at any time.

However, these system restore points can contain a lot of data that could eventually start to fill up your system drive - especially if you have a lower capacity drive such as an SSD. Windows allows you to manage the maximum amount of disk space given over to system restore. Navigate to the 'System' control panel or press the shortcut Win+Break key combination. The click on 'System protection'.

Here you'll see a list of drives and whether or not system protection is enabled on each. You can choose to enable to disable system protection on specific drives. We recommend enabling system protection on your system drive at least, as this is required for System Restore to work.

Select a drive and click the Configure button to change the options. You'll notice that you also have the option to delete all restore points for this drive. This will recover all the space used for system restore points, which is great if you're running low on disk space. However, it's an all-or-nothing option and it won't allow you to keep specific restore points.



If you want to delete only specific restore points, you'll need to use a third-party tool. One tool that can do this is CCleaner (piriform.com/ccleaner). Install the program, run it and select 'Tools' from the column at the left. On the right-hand side, select 'System Restore'. Now you can click on any specific restore point (except the most recent one) and click Remove to delete it, leaving the others intact.

Your laptop's specifications should include details on the maximum resolution of externally connected monitors. Some laptops are limited in terms of external monitor resolutions, while others can cope with displays up to 4K resolution.

You may also need to set up your external display manually, ensuring that you have the laptop configured either to use the external monitor only, or to extend the desktop onto both monitors. If you have your laptop's displays 'cloned' on to the external monitor, it will simply match it pixel for pixel and limit you to the maximum resolution of the laptop's built in screen.

If it's a modern laptop, there's a good chance you'll be able to run your external display at its full resolution, but check the laptop specs first just to make sure.

PERMISSION TO FLASH

Q I have recently started getting messages similar to "Adobe Flash Player settings: xxx is requesting permission to store information on your computer", where 'xxx' is the name of a site I'm visiting. This happens with sites such as earthcam.com. How can I stop it from asking me this every time I use the site?

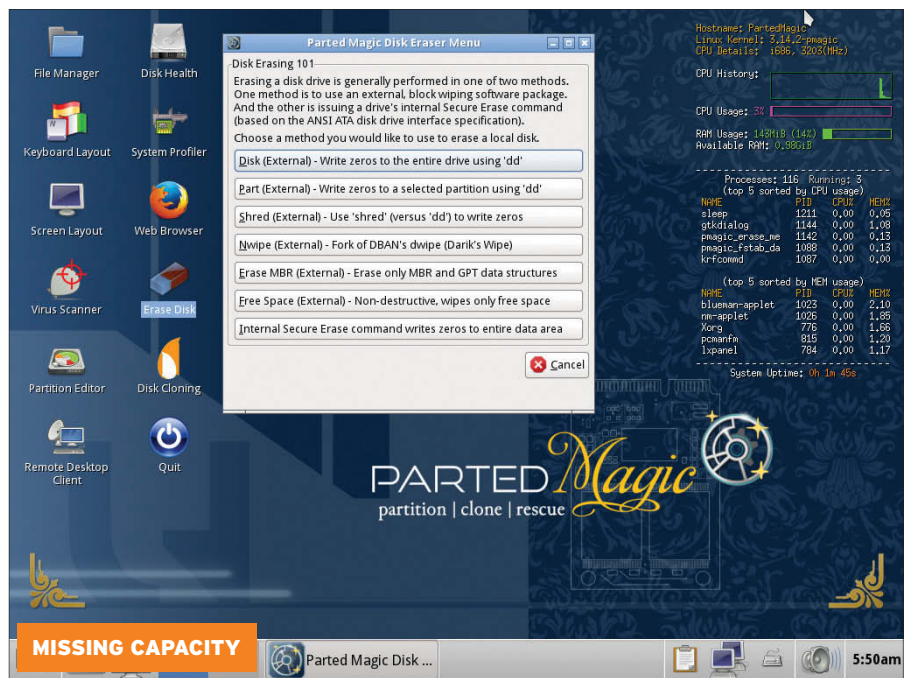
The settings for the Flash Player can be found in the Windows control panel. Open up the control panel and click on 'Flash Player 32-bit'. Now go to the Storage tab and you'll see some options controlling how access to local storage is managed.

Going from the information you have provided, it seems likely that you have the option set to 'Ask me before allowing new sites to save information on this computer'. Change this to 'Allow sites to save information on this computer', which you should stop being asked.

If you want to see which sites have been storing information locally, you can click the button labelled 'Local Storage Settings by Site'. This will bring up a list of sites, along with the amount of local storage they are using, as well as the level of permission granted. You should make sure that the site you wish to visit has a status of 'Allow'. You can change the permission by clicking on the site in question and then selecting a permission level from the menu below. You can also use this dialog to block any unwanted sites from using local storage.

MISSING CAPACITY

Q My SD card is showing a capacity of 1GB when it should be 4GB. Can I fix it or should I just throw it away? I'm using a USB SD card reader and when I plug in my card it shows up as



a drive, but Windows tells me it needs to be formatted before I can use it. If I go ahead with the format, the available size is only 1GB when I know it's a 4GB card. This led me to go to the Disk Management tool in Windows 8 and look at the drive there. Here I found what looked like several partitions, some of which I have managed to remove, but many of which stubbornly remain.

How can I completely erase my card and get back the full 4GB capacity?

Your SD card does indeed look a bit of a mess, so a low-level format is probably the best solution for you. You've already stated that you've been trying to format the card, so we'll assume there's nothing on it you're not prepared to delete.

A low-level format will completely erase your card without regard for any partitions or volumes which may exist. This principle also applies to other types of storage media, such as hard drives and SSDs.

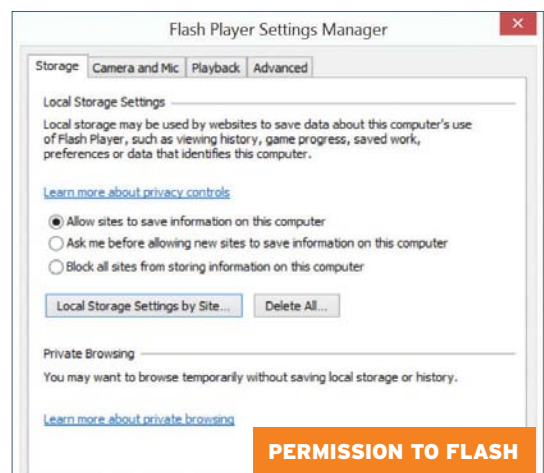
To perform the low-level format, you can use a free tool such as HDD LLF Low Level Format Tool from Hddguru.com (tinyurl.com/3jjcrf4). The free version of this tool is speed-limited to a maximum of 180GB per hour, but seeing as you're only formatting a 4GB SD card this won't be a problem. If you ever need to low-level format a 1TB drive, you may wish to pay \$3.30 (£1.95) for a home use version without the speed limit.

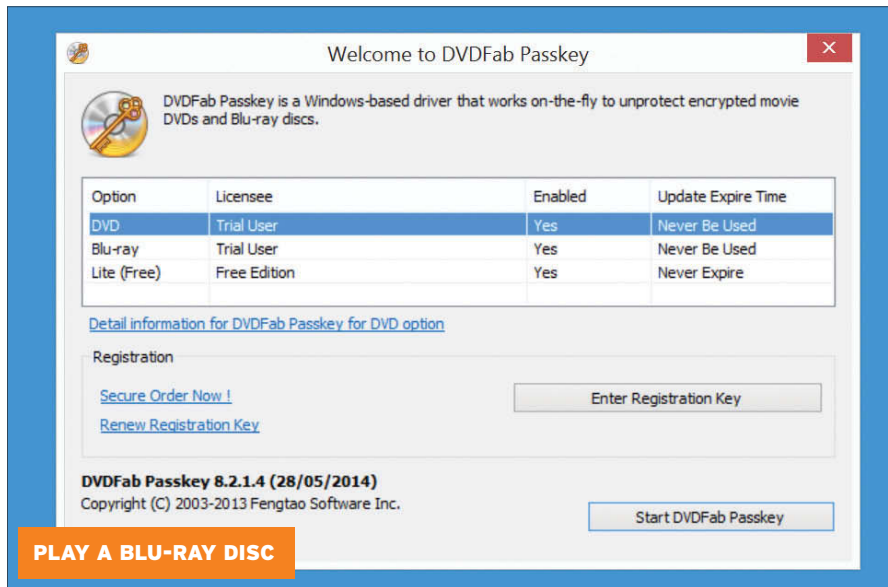
Be absolutely sure to select the correct drive before proceeding with the format, as it will

irretrievably delete all the data on the selected drive. Choose your main hard drive by mistake and you'll regret it. Once the low-level format is complete, you should be able to reformat your card and enjoy the full 4GB capacity once more.

In the case of troublesome SSDs, you'll often find manufacturer's offer software that will let you perform a secure erase function, zeroing out all locations of the SSD including those which cannot normally be accessed by computer software. This works by sending a Secure Erase command to the onboard controller of the SSD, effectively commanding the SSD to erase itself.

If your manufacturer hasn't provided a utility to do this, you can use a free tool called HDDEraser which can be installed on to a bootable USB drive. It can be downloaded from the author's website here - tinyurl.com/qf234gz. However, this tool is extremely fussy about exactly how you configure your drives and your PC BIOS, and can prove frustrating to use.





Parted Magic (partedmagic.com) is sadly no-longer free, but for just \$4.99 (£2.95) it provides a graphical interface and a huge selection of storage-related tools including an SSD Secure Erase utility.

PLAY A BLU-RAY DISC

Q I've installed a Blu-ray drive in my PC in the hope that I would be able to play Blu-ray discs and watch them on my monitor. However, I can't find a way to play these without buying some software. Is there a way to play Blu-ray discs for free on a Windows 8.1 PC?

If you want a trouble-free Blu-ray experience on your computer, then the short answer is no. Blu-ray playback requires licenced technologies, which must be paid for and

aren't included as part of the standard Windows 8.1 installation.

This is where products such as CyberLink's PowerDVD or ArcSoft's TotalMedia Theatre come into their own, providing the necessary software to enable Blu-ray playback. In fact, it's rare to obtain a PC with a Blu-ray drive that doesn't come with the necessary software somewhere in the box. Even off-the-shelf Blu-ray drives usually ship with some software provided you buy a 'retail' product rather than an 'OEM' one.

So, first of all, double-check the box and make sure there isn't some software lurking in there that you can install. If you're willing to put up with some unreliability, then there are ways to get several, although not all, Blu-ray discs to play. You'll need a player

and also a utility to decrypt the Blu-ray in the background.

One such decrypter is the free Passkey Lite, which is available from dvdFab.cn. Once installed, select either the free version or a trial of the full version and click the 'Start DVDFab Passkey' button. For playback, you can use a media player such as VLC from videolan.org, or PotPlayer from potplayer.daum.net.

Users have reported varying levels of success with these players, but expect to encounter the occasional problem, such as discs that won't play.

It's important to note here that, despite forthcoming UK legislation to legalise the 'ripping' of purchased DVDs and Blu-rays for personal use, circumventing anti-copying methods designed to prevent piracy may still remain illegal. DVDFab is currently under an injunction preventing its sale in the USA, which has seen the entire dvdFab.com domain shut down - hence the use of the Chinese URL above to obtain the software.

For these reasons, we'd suggest it's much simpler, not to mention more legally defensible, to bit the bullet and purchase some licenced Blu-ray software.

It's worth noting that, for around the same price as a PC Blu-ray software suite, you can buy a proper hardware Blu-ray player that can just as easily plug into your PC monitor as it can into a TV, provided you have a spare HDMI port and some speakers for audio playback.

AMAZON CLOUD PLAYER

Q Could someone please clue me up in simple words how to copy music to the Cloud from my Vista laptop and

Continues >>

TECH JARGON BUSTER

AKAMAI NETSESSION: The Akamai NetSession interface is a download manager that comes with many popular software titles, such as World of Warcraft. It's designed to provide more efficient and therefore faster downloads. It also includes the ability to upload data while your connection is deemed idle, thereby joining the user to a peer-to-peer network.

HDD: Often called a hard drive or hard disk, a hard disk drive is a device for storing computer data. Like system memory, it's typically measured in Gigabytes (GB), but importantly retains information when the PC is switched off. The HDD is where all your documents and programs are stored. Its performance is relatively slow compared to the rest of a

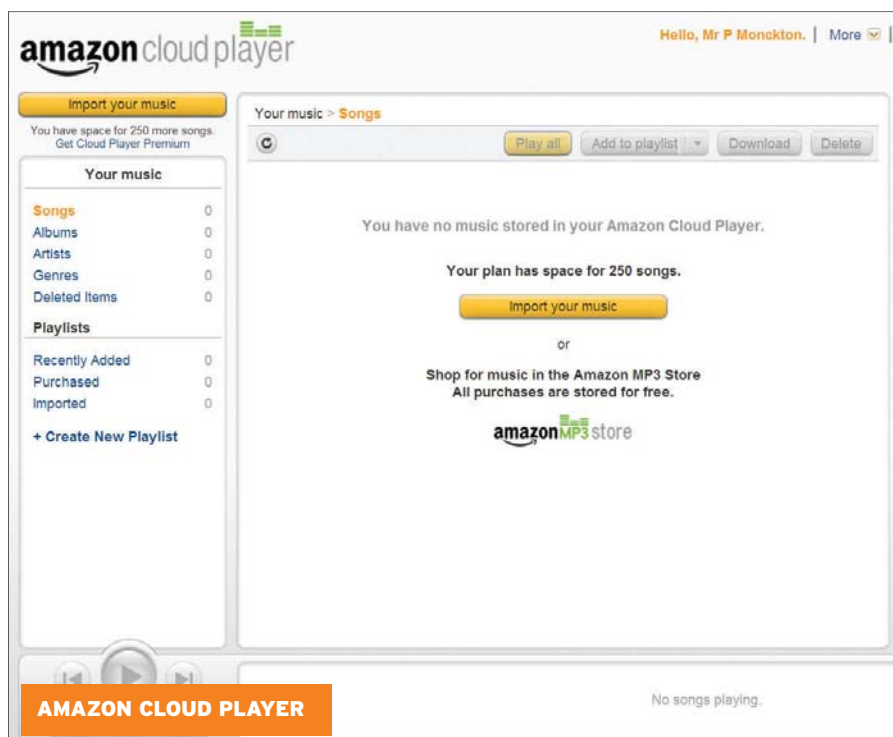
modern PC, so faster technologies such as SSDs and SSHDs have become popular.

PAGEFILE.SYS: Pagefile.sys is a Windows system file and a key component of Windows memory management. Its primary function is a kind of overflow for your PC's RAM when your programs need more system memory than the memory chips in your PC can provide. Typically found on your boot drive and located in the root folder, it's one of the larger files you're likely to find on your PC, but don't be tempted to delete it as doing so may cause programs to crash.

SSHD: A Solid-state hybrid drive or SSHD combines the rotating magnetic platters of a traditional hard drive (HDD) with the

fast memory chips of a solid-state disk (SSD). A built-in controller automatically decides which of your data goes on the HDD portion and which on the faster memory chips. Performance and prices fall between those of HDDs and SSDs.

STEAM IN-HOME STREAMING: Valve Corporation's Steam gaming platform allows users to play games stored on their gaming PCs on less-powerful devices by transmitting sound and graphics over a home network. Keyboard, mouse and joystick actions are sent back to the host PC as though connected locally. This feature is called Steam In-Home Streaming and it allows players to play their games on hardware that ordinarily wouldn't be able to run the games.



then access it from my Android tablet. I already have the Amazon Cloud Player wherein lie my recent downloads.

Amazon provides instructions on how to do this at tinyurl.com/Lmzxp5n. Put simply, you need to open up your favourite browser on your Vista laptop and go to the Amazon Cloud Player page at tinyurl.com/jwz7s46. Next, click on the 'Import your music' button in the top-left corner and follow the onscreen instructions.

If your music is stored in iTunes or Windows Media Player's libraries, the importer can automatically find your music and import it. If your music is

stored in other folders, then you have the option to locate them manually.

You can import up to 250 songs for free, but if you have more than this you'll need to pay £21.99 per year to upgrade to Cloud Player Premium and store up to 250,000 songs. Now either click 'Import all' or 'Import selected' to copy your music to the Cloud service.

On your Android tablet, go to the Play store and install the Amazon MP3 app. Run the app and click the button marked 'Cloud' and then 'Get Started'. This will prompt you to sign in to your Amazon account, from where you will be able to access your music stored on Amazon Cloud Play. ☒

CONTACT US



Email your Helproom questions to helproom@pcadvisor.co.uk. Please use 'Helproom' as the subject header and give your full name, the operating system you're using and other product details. We will let you know by email if your query has been selected for inclusion in these pages. If your query is urgent, you may find it useful to visit our forum at pcadvisor.co.uk/helproom.

Helproom aims to give you the best assistance possible. But, given the

limitations of this type of advice, we can't guarantee what we say will work and we can't accept responsibility for any damage arising as a result.

Always back up your system before you make any changes, including software installations.

Please note that we are unable to respond to letters or telephone requests, but we will endeavour to answer queries submitted by email or via our Helproom forum.

For more PC help go to:
pcadvisor.co.uk/helproom



SEARCH THE
PC ADVISOR FREE
ONLINE HELPROOM

The PC Advisor online Helproom contains an indispensable database of answers to common questions regarding all aspects of PC problems. This ranges from general Windows issues to problems with specific apps, and covers all types of PC hardware and software, including system components and peripherals.

Alternatively, you can ask for help from the experts on our online forums. Sign up to be a registered user - which is free - and then browse to one of the discussion forums. In the Helproom your first stop should be the searchable database of frequently asked and previously answered queries. With more than 1.5 million forum posts, you'll almost certainly find your answer in this archive of queries - just enter a few keywords.

If our online database can't solve your problem, try posting a question in the Helproom forum, where more than 200 queries are answered every day. The forum is manned by our team of Helproom Angels, who are ready and willing to lend a hand with anything from system crashes to virus alerts.

helproom@pcadvisor.co.uk
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Get mobile broadband on your laptop



Sometimes you need to access the internet while you're on the move, and only your laptop will do. Jim Martin reveals everything you need to know to get online

At home, virtually everyone uses Wi-Fi to connect to the internet from a laptop. But what do you do when you're on the move

anywhere out of Wi-Fi coverage? Some laptops have a SIM card slot, so you can get 3G mobile internet wherever you are – within 3G coverage areas obviously – but these are few and far between. The chances are your laptop doesn't have built in 3G, so your options are a USB dongle, a portable 'Mi-Fi' router or to tether your laptop to your smartphone or tablet. Here we'll look at each of these options.

MI-FI

Mi-Fi is a good choice if you want to share your mobile broadband connection between several Wi-Fi devices (including your laptop). This is a different type of 'dongle' which is best thought of as a portable wireless router. It's usually battery powered, but can work from the mains if you plug in its charger.

Three offers a Huawei 4G device for the fastest speeds (where there's 4G coverage). You can buy a Mi-Fi device, or a USB dongle, on its own but it pays to work out the total cost of the dongle and monthly cost. Some deals tie you into a 24-month contract,

while others let you buy the SIM only on a rolling monthly contract which you can cancel at any time.

If you're buying a dongle or Mi-Fi device from a mobile operator such as EE, Three or O2, watch out for any extra costs, such as renting the dongle, or buying a 'locked' device will work only with that operator's SIM cards.



USB DONGLE

Another option is a USB dongle, which is simply a means of adding a SIM card slot to your laptop. Dongles are available to buy on their own, both 3G and 4G versions, but you can also buy them from mobile operators in a package with a SIM – just as you'd buy a phone. Three, for example, offers a ZTE 4G dongle with data plans from £8 per month (with an up-front cost of £35 for the dongle itself). Virtually all mobile operators offer these USB dongles. You'll find that 3G plans (and dongles) are cheaper than 4G.

TETHERING

A third option is to share your smartphone's 3G or 4G mobile internet with your laptop (or tablet). In order to use your phone as a mobile hotspot, you'll need a smartphone that has this option (not all do) and a tariff which allows tethering. If you're unsure, speak to your phone or SIM provider. ☒

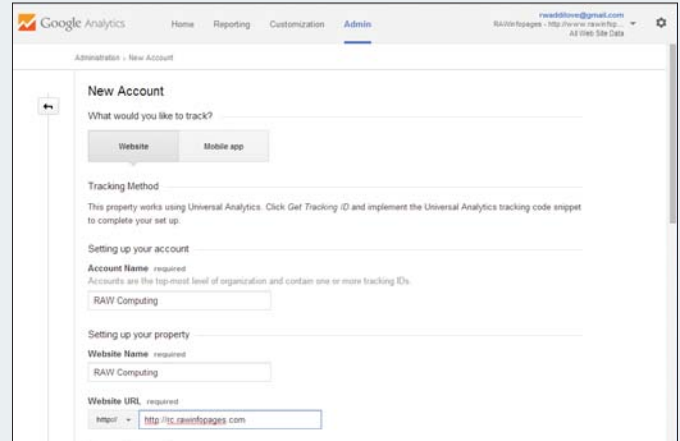


Track a site's traffic



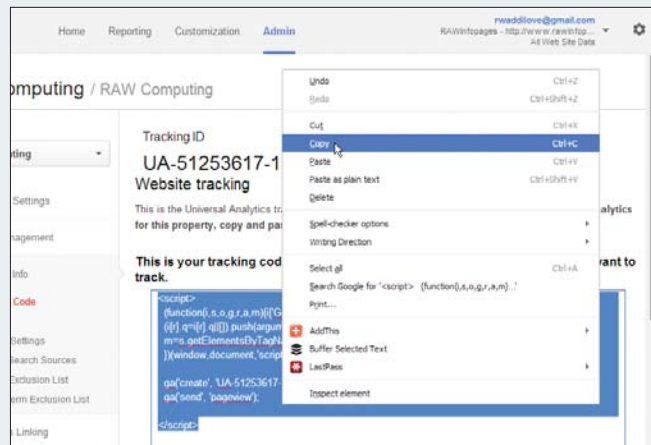
Google Analytics enables you to gain useful information about the visitors to your website or blog. Roland Waddilove explains how to use the free service

If you have a website or blog, it's vital that you know how many visitors you have, which pages they like best, if they use a tablet or smartphone, and so on. This information will influence the next web page or blog post you add to the site. While you can analyse the web server logs, fiddling around in the admin section of your website control panel isn't easy, and you can't give access to someone else. Google Analytics (google.co.uk/analytics) makes scrutinizing visitors easy, and you can add extra user accounts with limited access, so others can view and analyse the data, too. Analytics can show lots of useful data about visitors, and here we show how to get started with the new Universal Analytics.

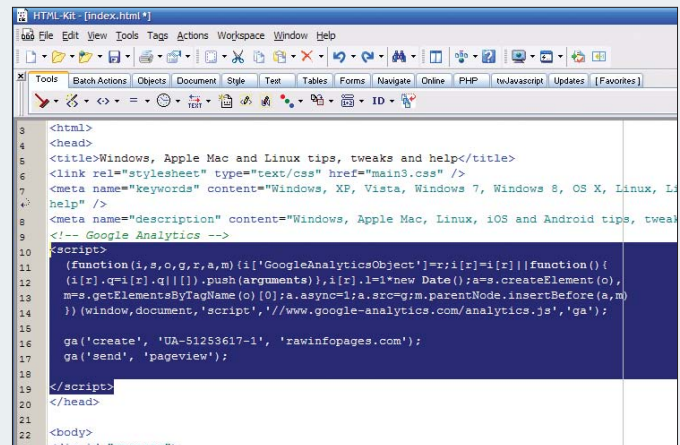


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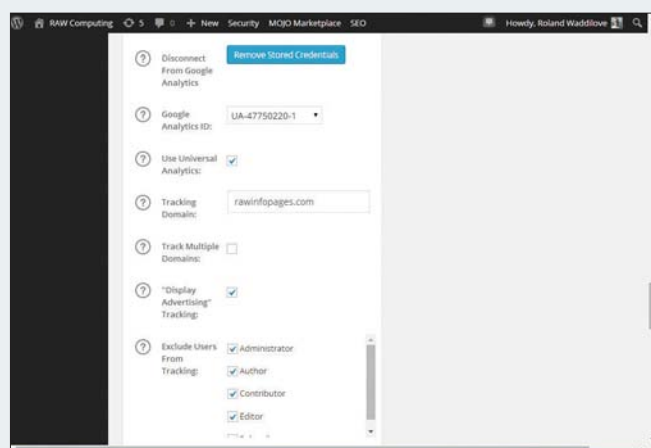
Click 'Admin' at the top and add a new account by clicking the Account button and selecting 'Create a new account'. Choose the Website option and fill in the boxes for the name, URL, site category, and so on. Universal Analytics is the default setting.



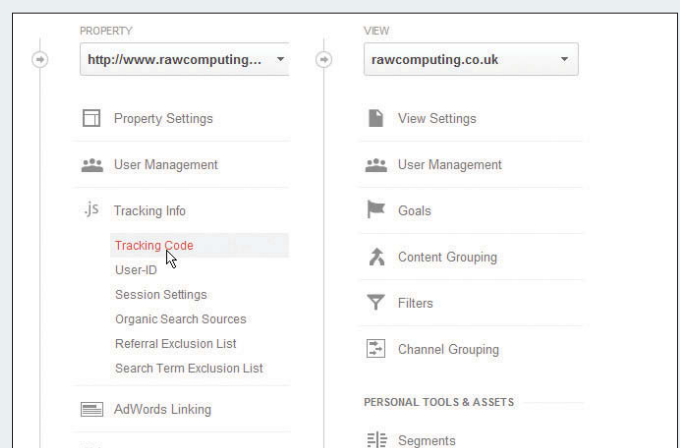
2 The account is created and the Universal Analytics tracking code is displayed. This must appear in the <head> section of all the pages on the website to track. Click and drag over the code with the mouse to select it, right-click it and select Copy.



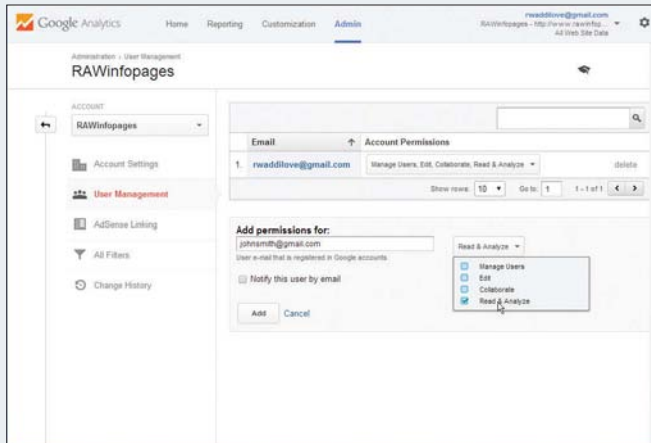
3 If the web pages are hand coded, you'll need to manually paste the analytics code. Load each web page into an HTML editor or Notepad, then paste in the code just before </head> near the start. Repeat this for every page on the website.



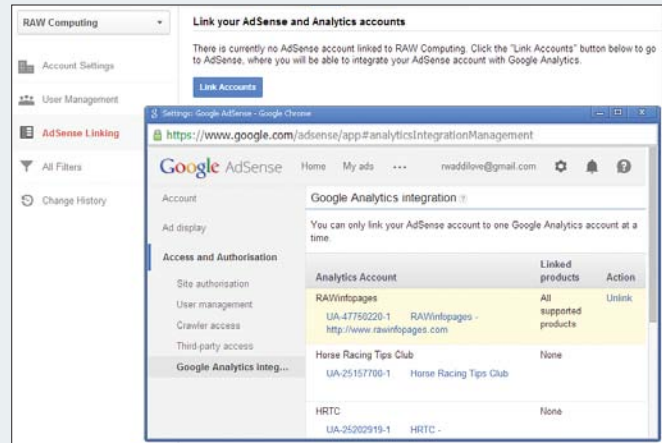
4 It's easier if your website or blog uses a content management system. There are Google Analytics plug-ins for WordPress, such as All In One SEO. Add your Google Analytics account, select the tracking ID (in Step 2) and tick Use Universal Analytics.



5 Return to the Admin page and select an account. If you have old tracking code there's an option in the Property column to upgrade to Universal Analytics. Use it, then get the new tracking code and paste it into your site as in the previous steps.



6 Web servers provide logs, but only the site admin can access it. Analytics enables you to create accounts for other users with restricted permissions. This lets them view and analyse the data without danger of them mucking up the account.



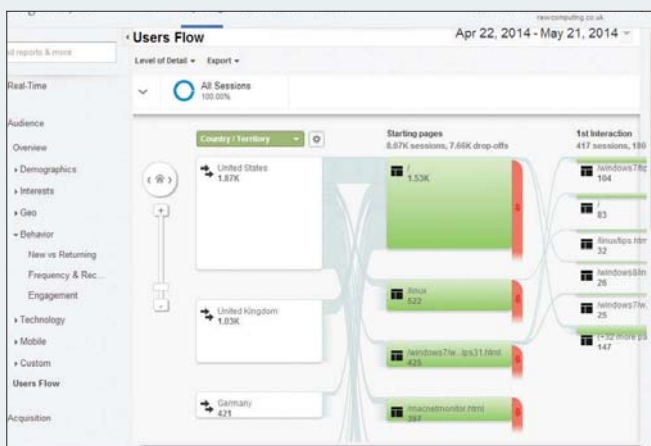
7 If you use AdSense to display adverts, select 'AdSense' and click 'Link Accounts' to open an AdSense window. Click the gear, then Settings, and go to Access and Authorisation > Google Analytics integration. Just select the Analytics account to link to.



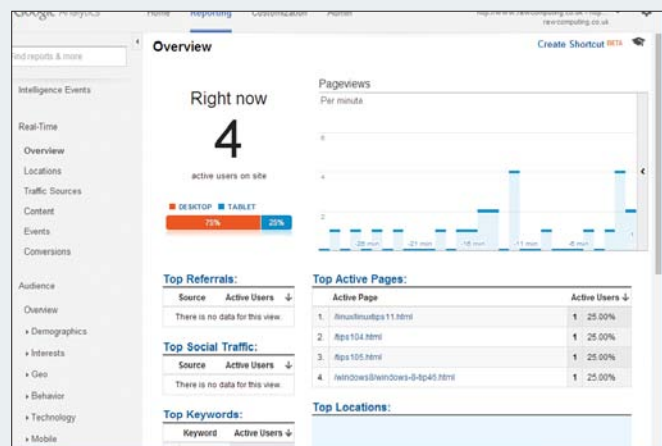
8 Let's go to the Reporting section at the top of the page. Select Audience > Overview on the left and then pick a date range at the top right. You can analyse the data for any time period you choose and see the number of visitors to the website.




9 The shocking truth. Selecting Audience > Behaviour > Engagement reveals that out of 1.29m page views, 833,498 stayed less than 10 seconds. It's details like these that statistics like page hits can't tell you. Ask yourself why people don't stick around.



10 See where visitors are from and what they view. Select Users Flow and you can see the country, starting page and first interaction. Everything is clickable, customisable and zoomable. Click Country and choose to view by OS, browser, mobile, and so on.



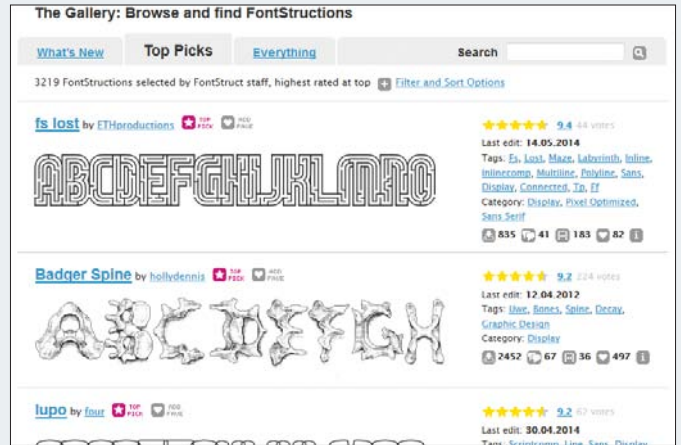
11 Expand the Real-Time section and you'll be able to watch people visit the website, see what pages they are accessing, whether they are using a desktop PC or tablet/mobile, and so on. A busy website might have hundreds or thousands of users. 

Create a font online



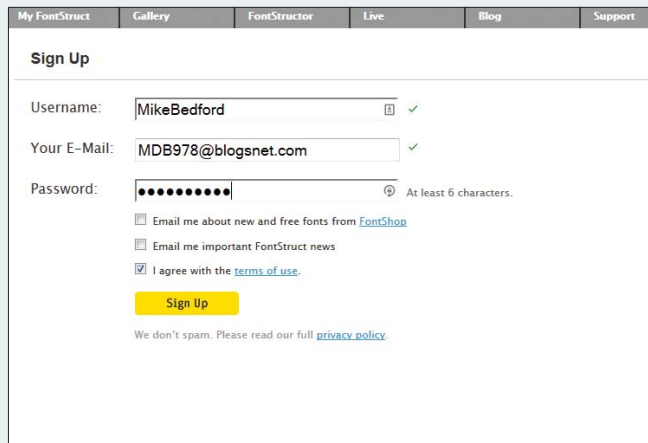
Mike Bedford reveals how to use FontStruct, an online font editor, to create fonts that are limited only by your imagination

Fonts might be plentiful and often free, but there are still times when you want something truly original. This means creating your own. Many font editors are tricky to use, but FontStruct takes a novel approach to simplify the process, so anyone can produce some unique fonts. Instead of having to get involved in the intricacies of accurately placing straight lines and editing curves, creating a font in FontStruct requires nothing more complicated than placing blocks on to a grid. Despite this simplicity, though, you can produce some amazing fonts. In our How To, we'll explain how to produce a simple font, but as you get to grips with FontStruct you'll find that the sky's the limit.

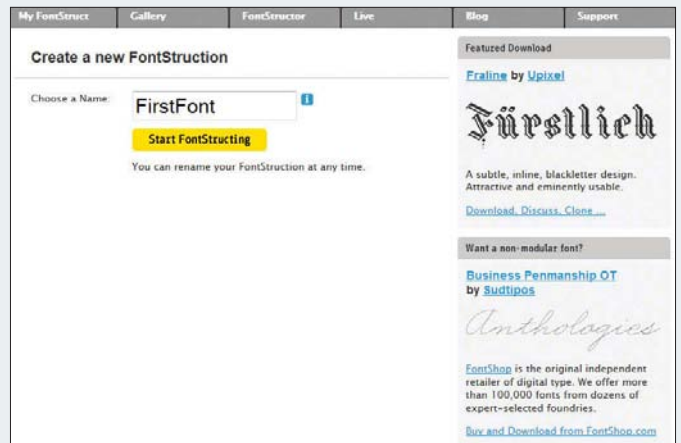


START

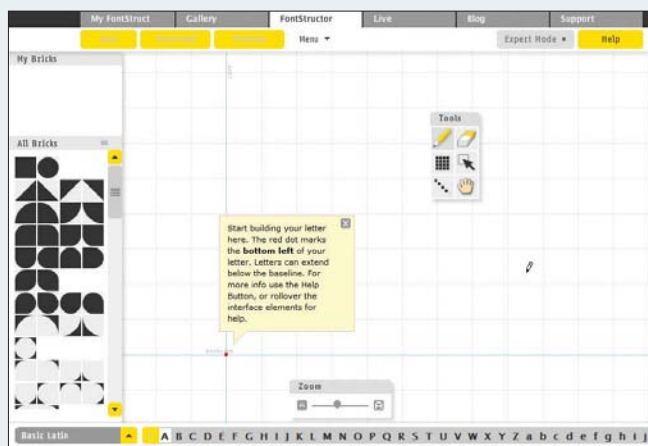
First, if you're sceptical that decent fonts can be built from blocks, head over to fontstruct.com, click on the 'Gallery' tab at the top and select 'Top Picks'. We trust that you'll be impressed at the flexibility that approach obviously provides.



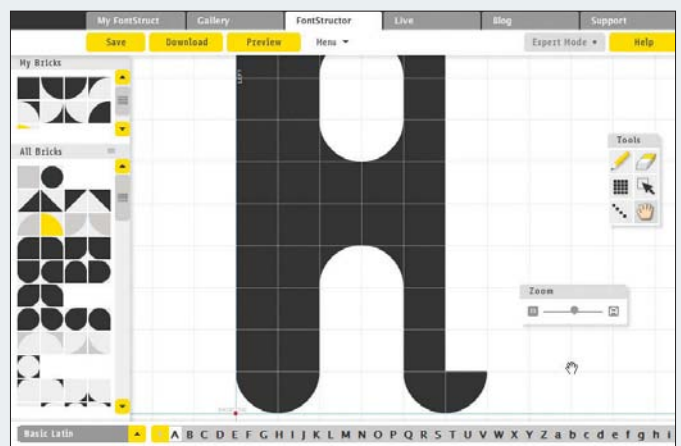
2 You don't have to pay to use FontStruct, but you do have to register. From the FontStruct home page, click on 'Start Now' and then, on the next page, select 'Sign Up Now'. Provide a username, your email address and a password.



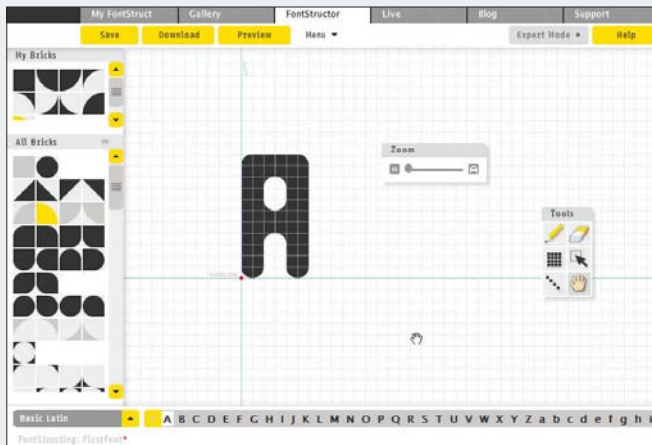
3 Once you've created an account, log in using the details you provided and click on the 'Create New FontStruct' button. On the next page, provide a name for your first font where indicated and click on the 'Start FontStructing' button.



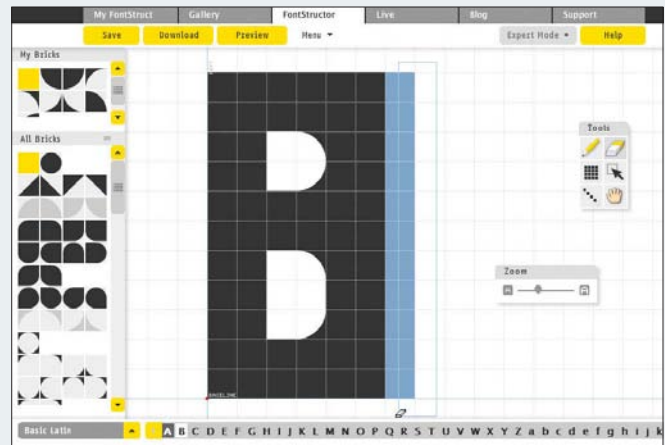
4 You'll be taken to the editing screen. The letter you're currently editing is selected at the bottom. The available blocks are at the left with the most recently used ones at the top. The grid is where you'll drop blocks to create characters.



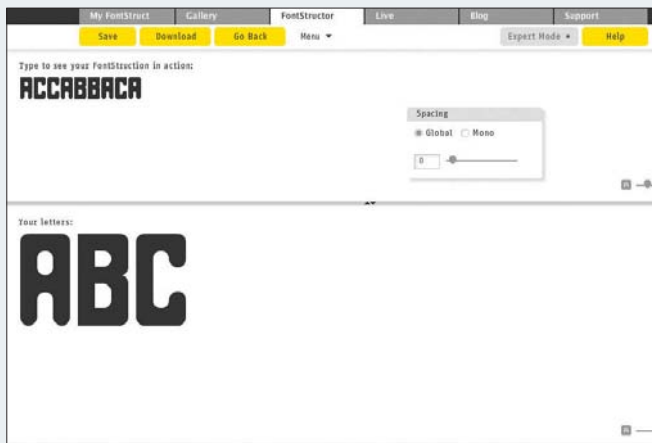
5 The pencil is initially selected in the tools menu, so a block will be added on the grid wherever you click. Try building up the letter 'A' using your chosen building blocks, making sure it sits on the blue baseline and against the left line.



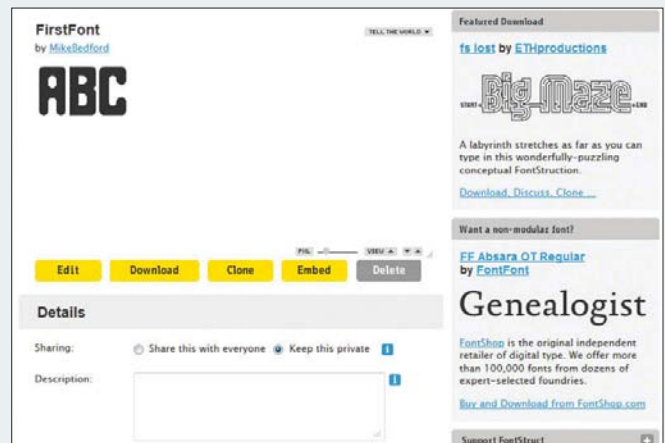
6 You can make letters as large as you want, as they'll automatically be scaled to the correct point size when you use them, for example in a word processor. The more complicated your font the larger it'll have to be. Use the zoom slider as necessary.



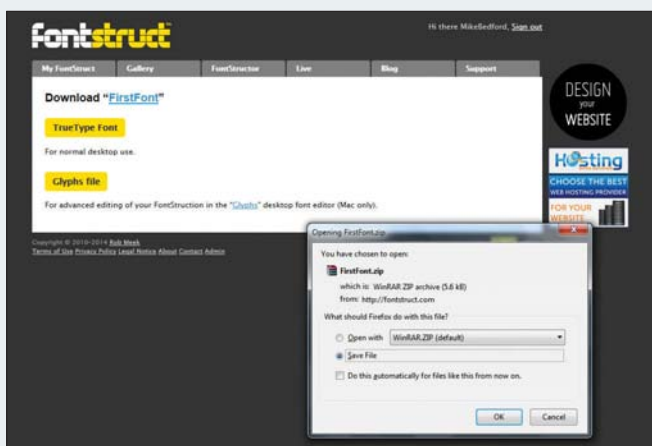
7 After you've used a few different blocks, you'll notice that the pencil tool cycles between 'My Blocks' on each click. Try some of the other tools, too. The eraser deletes an area of blocks after you've dragged round them and the hand allows you to pan.



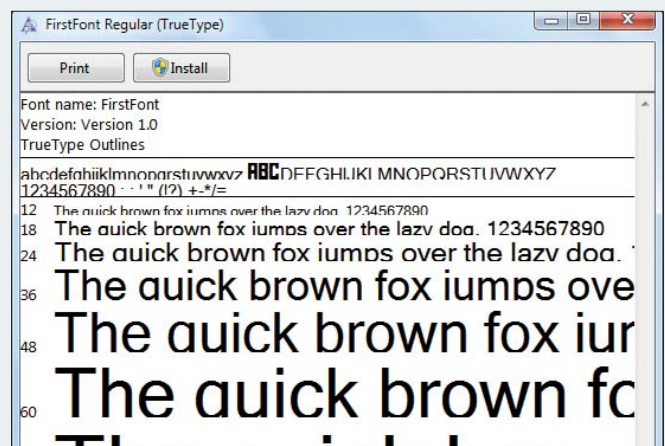
8 After you've created a few letters, how about trying them out. Click on 'Preview' to see your currently created letters at the bottom of the screen. At the top, you can enter any text that includes those characters. Click 'Go Back' afterwards.



9 Periodically save your creation in the cloud by clicking on 'Save'. When you're done, click on 'My FontStructs' and then select the name of your font. Here you can edit details such as a description, and whether you want to share your masterpiece.



10 Also, on this page, you can download the font to your PC. Click on 'Download' and then 'TrueType Font'. When prompted, choose to save it. The font will be downloaded to your PC, into your default download folder, as a Zip file.



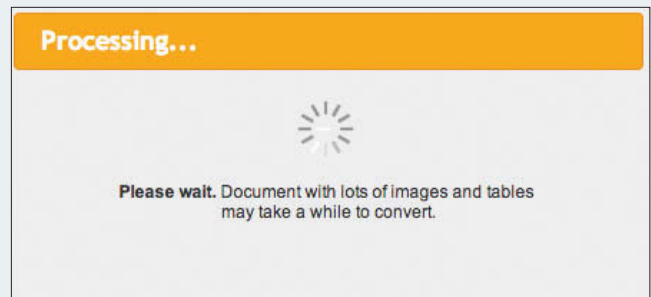
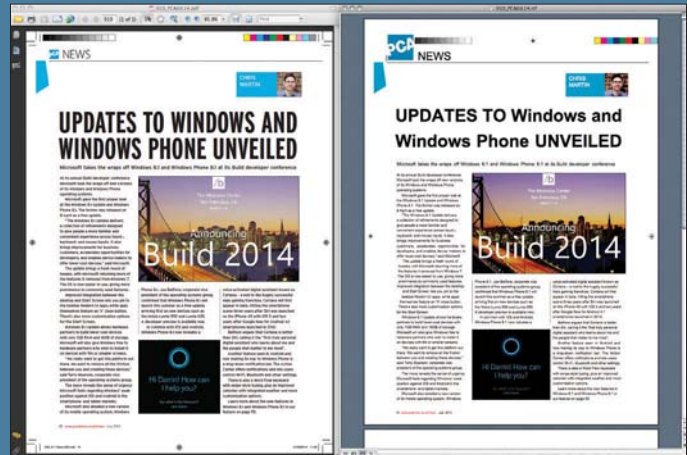
11 Uncompress the Zip file on your PC and, in the uncompressed folder, double-click on the font file that will have the name you gave it in FontStruct. Click 'Install' on the preview window and your font will now be available for use. ☒

Convert a PDF to Word using PDFOnline



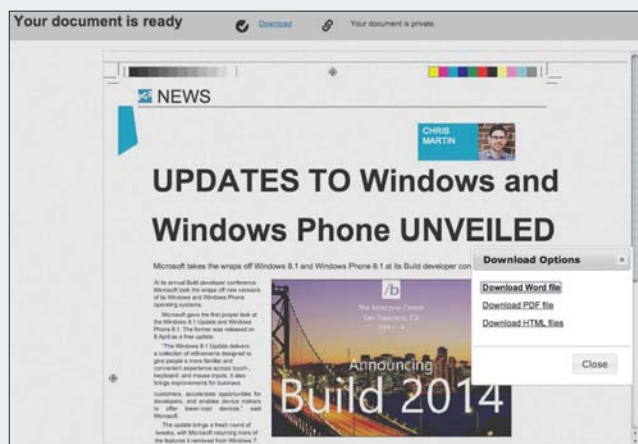
There are several ways to convert a PDF to Word format, but one of the easiest requires no software other than a web browser. Marie Brewis explains how

PDFOnline (pdfonline.com) is a free PDF converter that lets you upload PDFs to the web for conversion to Word, or vice versa. Note that by uploading your PDF to the web, you'll need to agree to the service's terms, which are listed in full on the website. Most importantly, while vendor BCL says it will respect your privacy and not monitor, edit or disclose information contained in the documents you submit, it's under no obligation to do so if action is required to comply with legal processes, protect its own legal rights, enforce its terms or protect the interests of other users. Therefore, we'd steer clear of uploading PDFs that contain sensitive information.

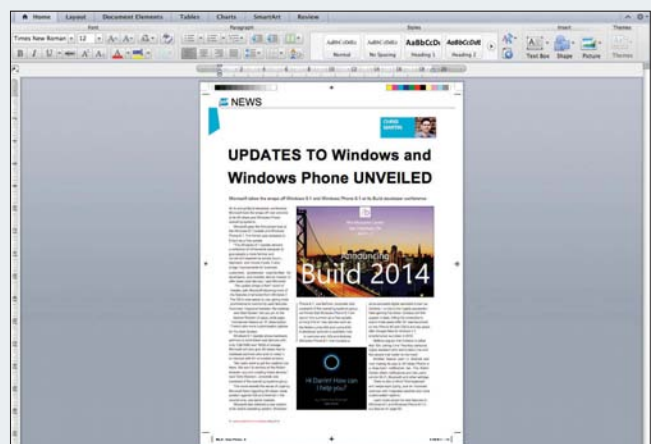


2 Go to the PDF you want to convert and click Open. If it has a lot of images and tables, it may take a while to convert.

START Go to pdfonline.com and click 'Upload a File to Convert...'.



3 Your PDF file will open in the browser window. Click Download at the top of the screen, then 'Download Word file'.



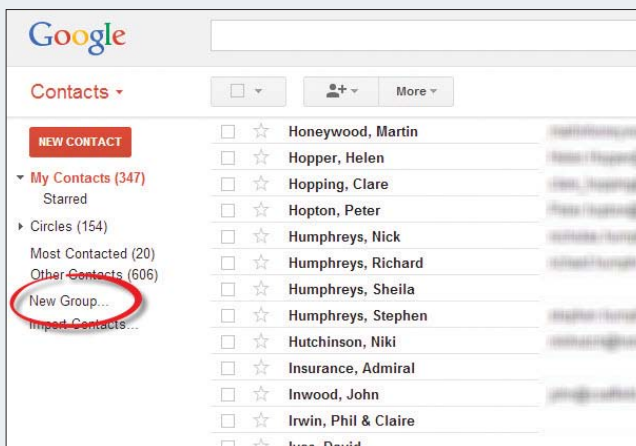
4 The file will be downloaded to your Downloads folder or wherever you have specified downloads should go. Double-click it to open it in a word processor. Depending on the complexity of your PDF, you may find some parts require editing in Word. ☒

Set up a group email

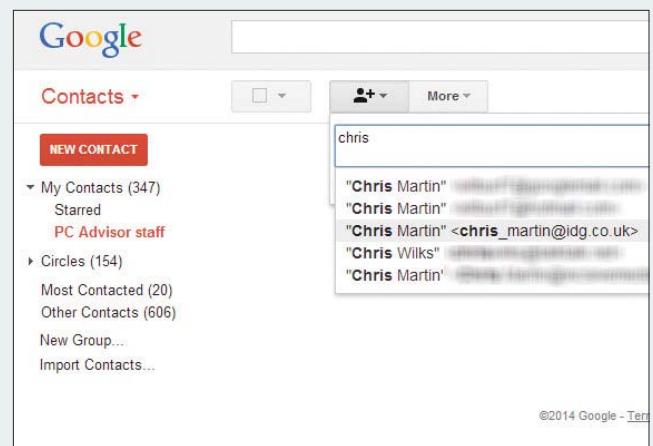


The method for creating an email group differs for each client, but the principles are the same. Here, Jim Martin uses Gmail to walk you through the process

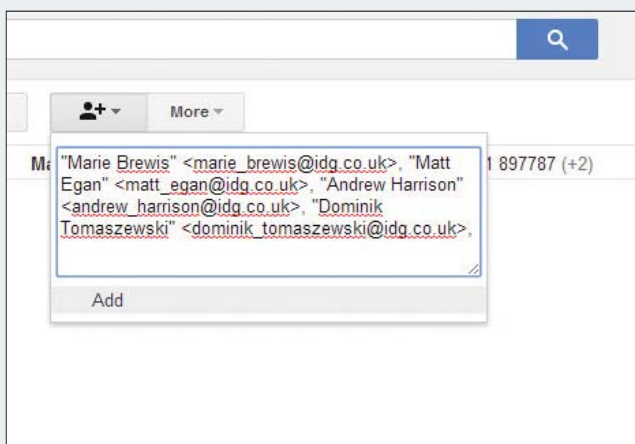
If you find that your email program doesn't allow you to create contact groups, there may be a workaround. For example, you can't create groups on an iPhone or iPad, but you can do so via the iCloud website. You might also find that while you can create a group of contacts (as with iCloud), you can't then select the group when sending an email. For small numbers of people, it might be faster to type the first few characters of their name and use your email application's autocomplete function to select their address. When you need to email a large number of people regularly, this method is unworkable, as it takes too long and you might miss people off the list.



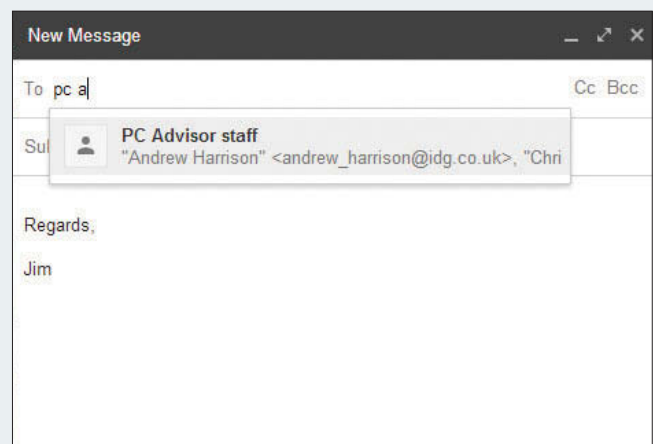
START In Gmail, click the Gmail drop-down menu and switch to Contacts. Now click the New group... link in the left-hand menu and enter a name for the group.



2 The new group will appear under Contacts in the left-hand menu. Click on its name, then click the Add to group button (the head icon with a +). In the box, start typing a contact's name and then select the correct email address from the list.



3 When you click on a contact's email address, you can begin typing the next person's name. Once you've added everyone, click the Add button at the bottom of the box.



4 Now use the drop-down menu to switch back from Contacts to Gmail and click the red Compose button. Type the first few letters of your group name and it should auto-complete. Click on it to add all the people in the group to the list of recipients. ☒

Get the most from your solid-state drive

From file wrangling to house cleaning, Chris Hoffman reveals how to get the more from your SSD

If you're still using a mechanical hard drive, you might consider upgrading to a solid-state drive – it will give your PC a speed boost on everything from boot times to game loading screens. SSDs aren't the perfect replacement for mechanical hard drives just yet, though, due to their far higher per-gigabyte costs and a few quirks. Read on to learn how to put that rip-roaring SSD to best use.

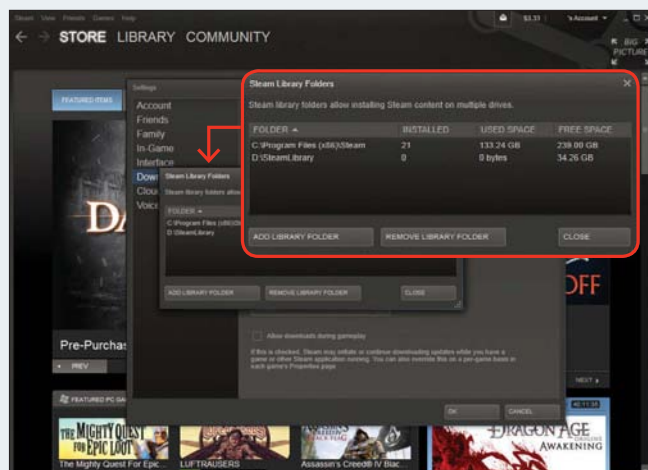


Move programs and games

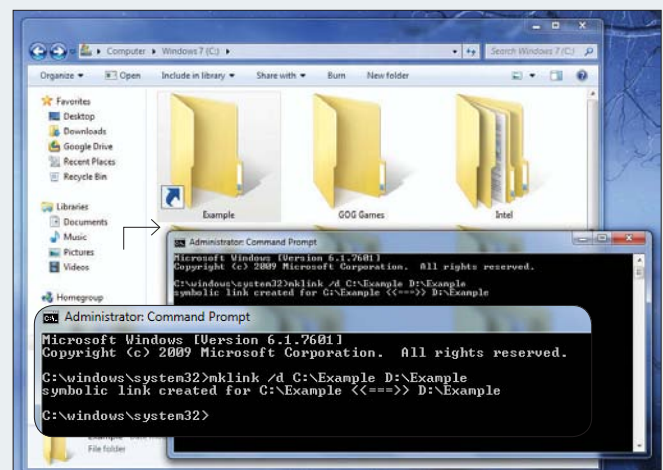
Your solid-state drive (SSD) should hold your Windows system files, your installed and regularly used programs, and any games you're currently playing. On the SSD, they'll load in a flash.

If you're retaining a traditional mechanical hard drive to serve as wingman, it should store your media files, documents, and any files you access infrequently, as these items don't benefit from an SSD's blinding speed.

When you're installing an application, choosing its destination drive is easy. Moving applications after the fact is trickier. You can move your entire Steam folder, for example, to a new drive and simply run the Steam.exe file to launch it and then play your games. Most programs, however, will display errors if you attempt to drag and drop their folder elsewhere. You'll either need to uninstall the program and reinstall it to the new location or use symbolic links.



For **STEAM GAMES**, open Settings, select Downloads, click Steam Library Folders, and add a new folder on a different drive



Here's what to type to **CREATE A SYMLINK** from an 'Example' folder on the C:\ drive to D:\Example

“ With storage at a premium, you’ll want to eliminate junk files regularly ”

With symbolic links (aka symlinks), you can move a directory but make Windows perceive it at its original location. To create a symbolic link, use the ‘mklink’ command in a Command Prompt window. (Search for cmd.exe in Windows’ Run box to bring up the Command Prompt. To create a link outside your user folder, you’ll need to open the Command Prompt window as an administrator.) To move C:\Example to your D: drive, you’ll have to drag the C:\Example folder over to D:\Example in Windows Explorer, and then run the mklink /d C:\Example D:\Example command. Afterwards, whenever a shortcut, Registry entry, or any other component of Windows looks up C:\Example, the pointer will transparently redirect it to D:\Example.

Arrange Windows system folders

You can move your main user-data folders easily. For instance, to shift the Videos folder over from your main system drive (the SSD) to your secondary drive (the mechanical one), first locate the Videos folder within C:\Users\yourusername. Right-click it and choose Properties, and then open the Location tab and select a new place for it. You will still see a folder at C:\Users\yourusername\Videos, and this will continue to appear as part of your Videos library, though, its contents will reside on the other drive. This arrangement also works for your Music, Pictures, Documents, and Downloads folders.

In addition, you can choose the drive on which Windows is installed. If you’re setting up the computer from scratch and installing Windows yourself, click the Custom option in the installer and select your SSD as the destination. If you’re buying a solid-state drive later, you can move the operating system to that new SSD with a drive-cloning program, or just reinstall Windows (after backing everything up).

Keep some space free

SSDs slow down as you fill them because the drive ends up with a lot of partially filled blocks, which the drive writes to more slowly than it does empty blocks. Plan on using a maximum of 75 percent of the drive’s capacity for the best performance.

With storage at a premium, you’ll want to eliminate junk files regularly. For example, nVidia’s graphics driver updates leave an unnecessary folder under C:\NVIDIA after you install them. This folder contains the installer files, which you would require only for

reinstalling or repairing the driver. They take nearly 500MB of space that you could put to better use.

A utility such as the free CCleaner (piriform.com/ccleaner) can scan your drive for unnecessary temporary files and delete them. And the WinDirStat tool (windirstat.info) can help you figure out where your storage space is going.

Should you reduce writes to your SSD?

SSDs can accept only a limited amount of writes before they start to fail. Sounds scary, but don’t worry.

You’ll get many years of use out of an SSD without hitting its write-cycle cap, especially if you store media files and documents on a mechanical hard drive. And even if you don’t do that, you’ll likely buy new hardware long before your SSD gives up the ghost.

You could avoid saving temporary files to your SSD; for example, redirect your browser cache and Photoshop scratch disk to a regular hard drive. Doing so, however, will lead to slower performance when your computer needs to access those files. You’re probably better off tolerating the greater amount of writes for the increased performance.

Don’t defrag your SSD. Avoid defragmenting a solid-state drive. Period. On a solid-state drive, shuffling all those bits around wouldn’t improve performance, but it would involve many extra writes and therefore reduce your drive’s life span.

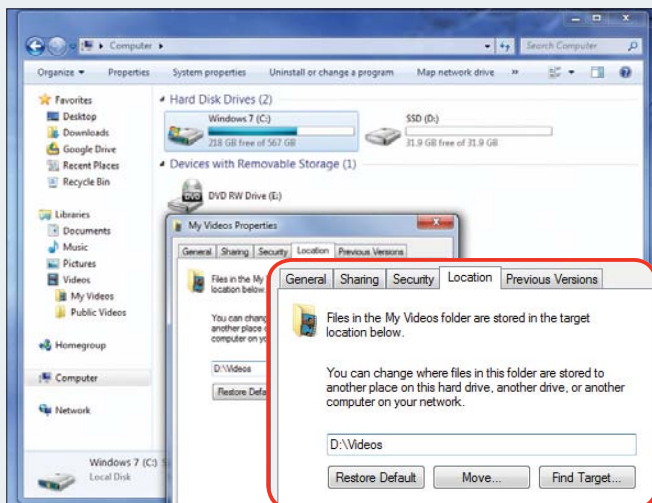
Let TRIM run wild

Solid-state drives can write data only to empty sectors. If an SSD needs to modify a filled sector, it has to read that sector, note the contents, modify them, erase the sector, and then write the modified contents. The extra steps take time.

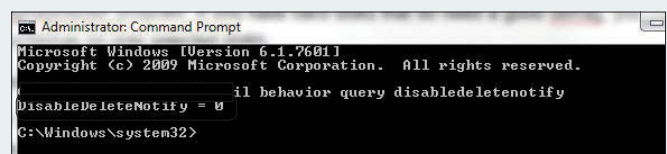
An operating system typically deletes a file by marking its data as deleted and erasing the pointer to it; that old data still exists, and the OS overwrites it only when that space becomes necessary for writing new files. The TRIM command, however, tells an SSD to erase and consolidate cells that are no longer in use, so writing to those sectors in the future will be as fast as when the drive was new.

In Windows 7 or later, TRIM is enabled by default. TRIM doesn’t work on Vista or XP. (If you’re an XP holdout, see tinyurl.com/pkbos3t to learn why you should upgrade.) On older operating systems you’ll need to use a third-party SSD management tool (such as Samsung’s SSD Magician or Intel’s SSD Optimizer) to force TRIM, or follow the trick outlined in our sister publication *PC World*’s guide to restoring an SSD to peak performance (tinyurl.com/ok4fx6d).

Unless you need to force TRIM, skip ‘SSD optimization’ software. Newer operating systems use TRIM by default anyway, and your SSD’s firmware already includes ‘garbage collection’ tools that perform housekeeping tasks. There’s no evidence that any extra utility can improve on those operations. ☒



Windows makes **MOVING USER DATA** from a hard drive to an SSD simple. Just click the Move button



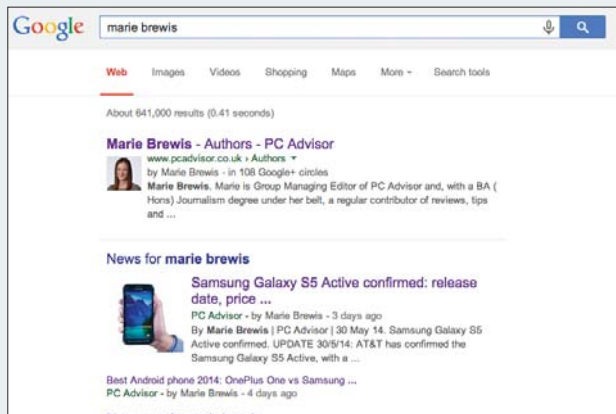
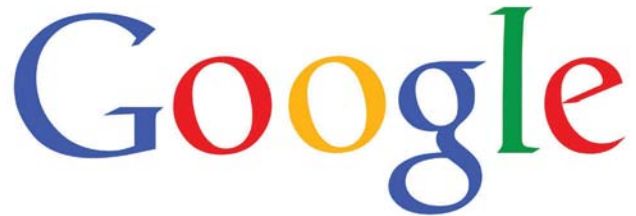
To confirm that **TRIM IS ENABLED** on your Windows 7 or 8 PC’s SSD, open the command prompt and type ‘fsutil behaviour query disabledeletenotify’ (without quotation marks or end punctuation). If ‘DisableDeleteNotify = 0’ appears as a response, you’re set. If not, confirm that your SSD’s drivers are up to date

Remove your name from Google searches



A recent EU court ruling means you can now ask Google to remove you from its search results. Marie Brewis reveals how to make Google forget you

Is there something in your past that threatens to ruin your reputation - something to which Google insists on flagging up whenever someone Google's your name? Good news: a recent 'Right to be forgotten' EU court ruling means you can now ask Google to remove specific listings about you from its search results. Here's how to remove your name from Google search results and make Google forget you.



Hidden, but not gone

It's worth pointing out that although Google is the largest search engine, it is not the only search engine. While it may agree to remove a specific URL that offends you from its own search results, the article may still be found through Bing, Yahoo and other search engines, and it will still exist on the web, accessible to anyone who knows the web address. Google simply makes it more difficult for people to stumble upon that information.

Visible outside the US

Also note that the URL will be hidden by Google only within the EU. Someone searching from the US, for example, might still be taken to the offending article within search results.

Contact Google

Requesting that a URL is removed from Google's search results is a very simple process. Simply fill in the Search removal request form (pictured right) and submit it along with some photo ID. You will also need to provide your name, an email address and any offending URLs that you want to be removed.

What happens next?

Once it receives notification that you want to remove a URL from its search results, Google's removal team will assess the case. It's under an obligation to remove only the results that are inadequate, irrelevant or no longer relevant, or excessive in relation to the purposes for which they were processed. According to the company, many of the results it has been asked to remove include cases where an individual has been accused and later cleared of fraud or a scam, violent or serious crime, or child pornography.

There's no set timeframe within which Google must remove the results. We expect that the removal team will be inundated with requests over the next few weeks.

"In implementing this decision, we will assess each individual request and attempt to balance the privacy rights of the individual with the public's right to know and distribute information. When evaluating your request, we will look at whether the results include outdated information about you, as well as whether there's a public interest in the information - for example, information about financial scams, professional malpractice, criminal convictions or public conduct of government officials," says the company.

Once a URL is removed from its search results, Google will place a message on that page confirming that some results have been removed following a complaint. This means that even though you'll have removed the offending information, those who search for you by name will know you have tried to hide something.

For more on Google and the right to be forgotten go to page 14.

Search removal request under European Data Protection law

You will need a copy of a valid form of photo ID to complete this form. Fields marked with an asterisk * must be completed for your form to be submitted.

We're working to finalise our implementation of removal requests under European data protection law as soon as possible. In the meantime, please fill out the form below and we will notify you when we start processing your request. We appreciate your patience.

Please select the country whose law applies to your request *

Please select one

Your information

Name *

The full name for which you are requesting search results to be removed

Your name

Your own name, if different

Your relationship to the person you represent, if not yourself (for example, "spouse" or "lawyer")

Contact email address *

(where confirmation email will be sent)

Links associated with your name that you want removed

For us to evaluate your request, you must:

(a) Provide the URL for each link appearing in a Google search for your name that you request to be removed. (The URL can be taken from your browser bar after clicking on the search result in question).

(b) Explain, if not clear, why the linked page is about you (or, if you are submitting this form on behalf of someone else, the person named above).

(c) Explain how this URL in search results is irrelevant, outdated or otherwise inappropriate

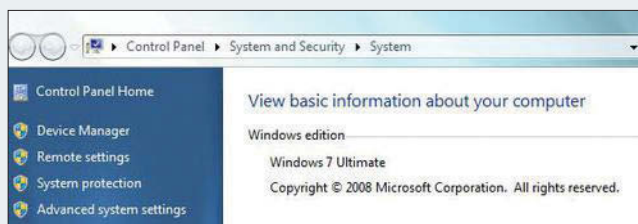
URLs that you want removed *

Reinstall Windows 7 without the disc



If you've lost your Windows DVD, or you never had one, you can still reinstall Windows 7 without it. Jim Martin walks you through what you need to do

First off, you'll need to have your Windows licence number or, to use its correct name, the product key. This might be printed on a sticker somewhere on your laptop or PC, or on some documentation provided with it. If you don't have this, or you've lost it, you'll need to have access to Windows running on your computer. The reason being that you can get the product key using a free utility called Magical Jelly Bean Keyfinder (tinyurl.com/849jdp6). This can also extract keys for other software. You won't be able to get the product key if your hard drive has broken, or if Windows is corrupt and you can't get it to boot, or you can't log in. Assuming you have the product key, you're sorted, as it's easy to download the installation files for Windows online. You will, however, need to know exactly which version of Windows your product key is for.



START Go to the Control Panel, then System and Security, and finally System. Along with other information about your PC or laptop, this will tell you precisely which version of Windows 7 it is. Keys should work with either 32- or 64-bit versions of Windows 7, but you can't swap from Windows 7 Home Premium to, say, Windows 7 Ultimate.

2 Armed with this knowledge, use one of the links below where you can legally download an ISO image of the required installation disc:

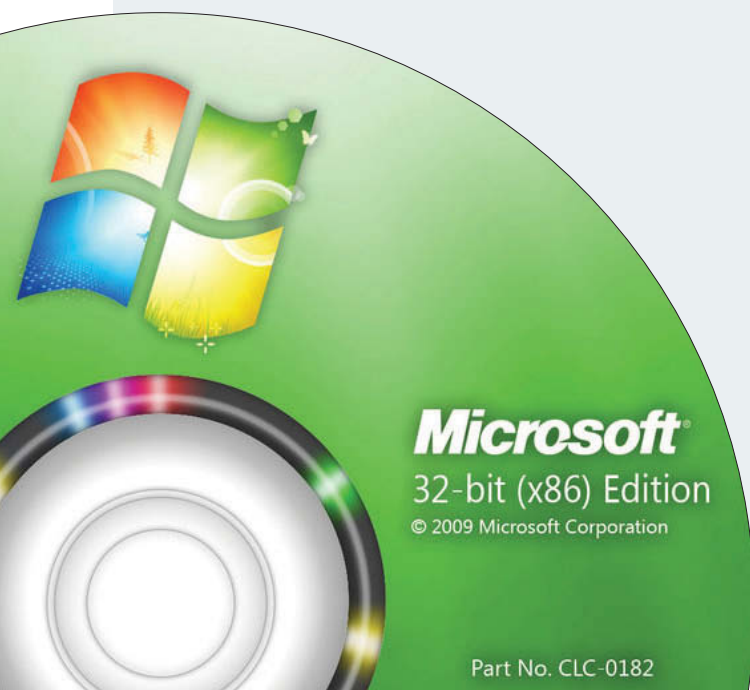
- **Windows 7 Home Premium 32-bit**
tinyurl.com/3suudba

- **Windows 7 Home Premium 64-bit**
tinyurl.com/3symn4c
- **Windows 7 Professional 32-bit**
tinyurl.com/3ko5hd5
- **Windows 7 Professional 64-bit**
tinyurl.com/42vmzxm
- **Windows 7 Ultimate 32-bit**
tinyurl.com/3ge287b
- **Windows 7 Ultimate 64-bit**
tinyurl.com/3zvou9a

3 Now you have the disc image, you'll need to burn it to a DVD, or extract it to a suitable USB flash drive. You can't simply copy the ISO file to a flash drive or DVD. Instead, use a tool such as Microsoft's own USB/DVD tool (tinyurl.com/dxnuzu5).

4 Shut down your computer and insert your DVD or USB flash drive. Now power on the PC and it should boot from the disc or drive. If not, you'll need to enter the BIOS and change the boot order to prioritise the DVD drive or USB drive.

5 When you get your computer to boot from the disc or USB drive, you can install Windows 7. Be careful, though. If you're planning to do a fresh install and format the hard drive as part of the process, make sure you've backed up all your documents, music, photos, videos and other files you don't want to lose. ☒



LETITIA
AUSTIN



ONLINE
REGISTRATION
REQUIRED

Ashampoo WinOptimizer 11

FULL PROGRAM (100 DAYS OF UPDATES) AVAILABLE ONLY ON THE DISC+

Installation details

Go to My Computer, right-click the disc icon and open the disc. Next, select Files230\Ashampoo WinOptimizer 11 and then open the install file

Online registration required: follow the links during installation before 14 Oct 2014

System requirements

Windows XP/Vista/7/8;
512MB RAM; 100MB
hard disk space

We all like fast and secure computers, but only constant system maintenance and time-consuming optimisations will keep them that way. Those of us who like to invest time and effort to keep up with the latest developments may very well handle those tasks using default Windows tools alone. But that can be a lot of work.

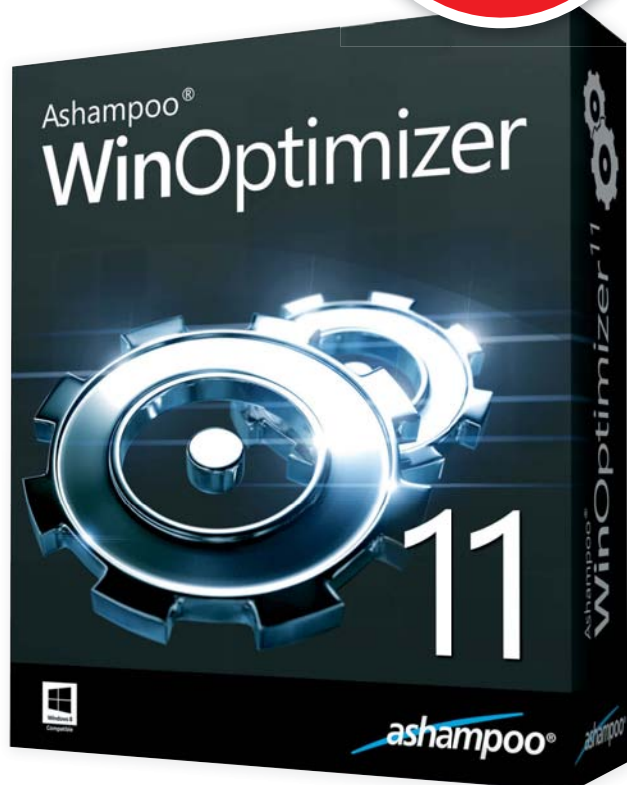
WinOptimizer will do the work for you, fast and efficiently. It will give you maximum performance and security, and save you precious time so you can get real work done.

Features

- Speed up any application launch with Live Tuner
- Improved user handling through restructured start page with better program feedback
- Manage system restore points with System Restore Manager
- Wizard-driven optimisation with Tuning Assistant
- Automatic optimisation runs with Task Scheduler
- Save and restore all changes with Backup Manager
- Excellent gaming performance in a click with Game Booster
- Manage system policies with User Rights Manager
- Enhanced user experience
- Increased performance and more efficient memory usage ☒



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Incomedia Website X5 Home 10

FULL PROGRAM

**ONLINE
REGISTRATION
REQUIRED**

Installation details

Go to My Computer. Right-click the DVD icon, and open the disc. Select Files 230\ Incomedia Website X5 Home 10 and open the install file

Online registration

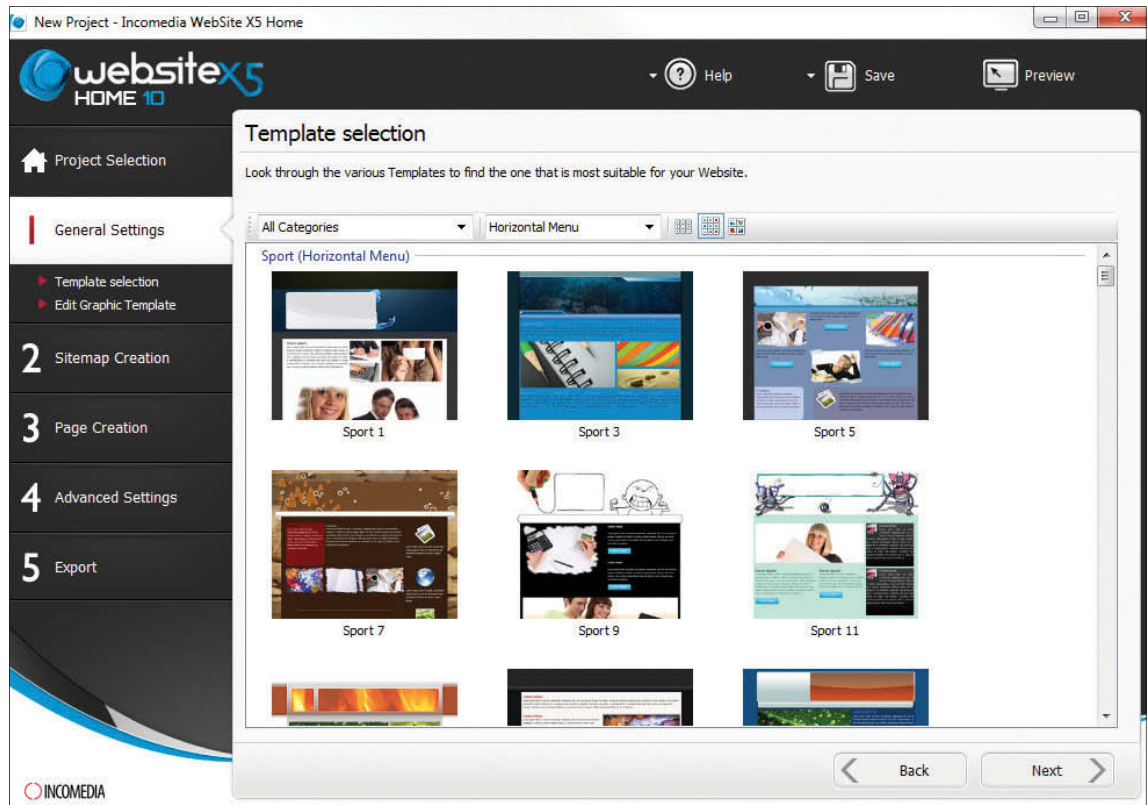
required: head to tinyurl.com/ma7qs8d before 14 Oct 2014

System requirements

Windows XP/Vista/7;
1GB RAM; 1024x768
screen resolution;
internet connection

Publication

requirements:
Windows/Linux/Unix
Server/PHP 4.x/5.x




Website X5 Home 10 helps turn your website dreams into reality. It provides you with 250 predefined templates, all professional-quality and ready for use. You will find a suitable template for whatever project you have in mind, and all without the fuss of learning graphic design.

You can add new pages to your site whenever you want, and organise your site map according to your needs. The automatic SiteMap generator makes your site easy to use for visitors, and easy for search engines to find.

Website X5 provides a unique way of creating website pages: all you do is drag-and-drop text, images, videos, sound and Flash animations into the various pages to create an interesting, eye-catching project.

With Website X5 Home 10 you have everything at your fingertips: a text editor, buttons for social networks, support for importing videos from YouTube and more.

Your websites on tablets and smartphones

Website X5 Home 10 will automatically generate your page code to ensure full compatibility with all browsers and mobile devices, including iPhones and iPads. The final step is to use the FTP engine, which makes it child's play to publish your website online. 

1-abc.net Password Organizer 7

FULL PROGRAM AVAILABLE ONLY ON THE DISC+

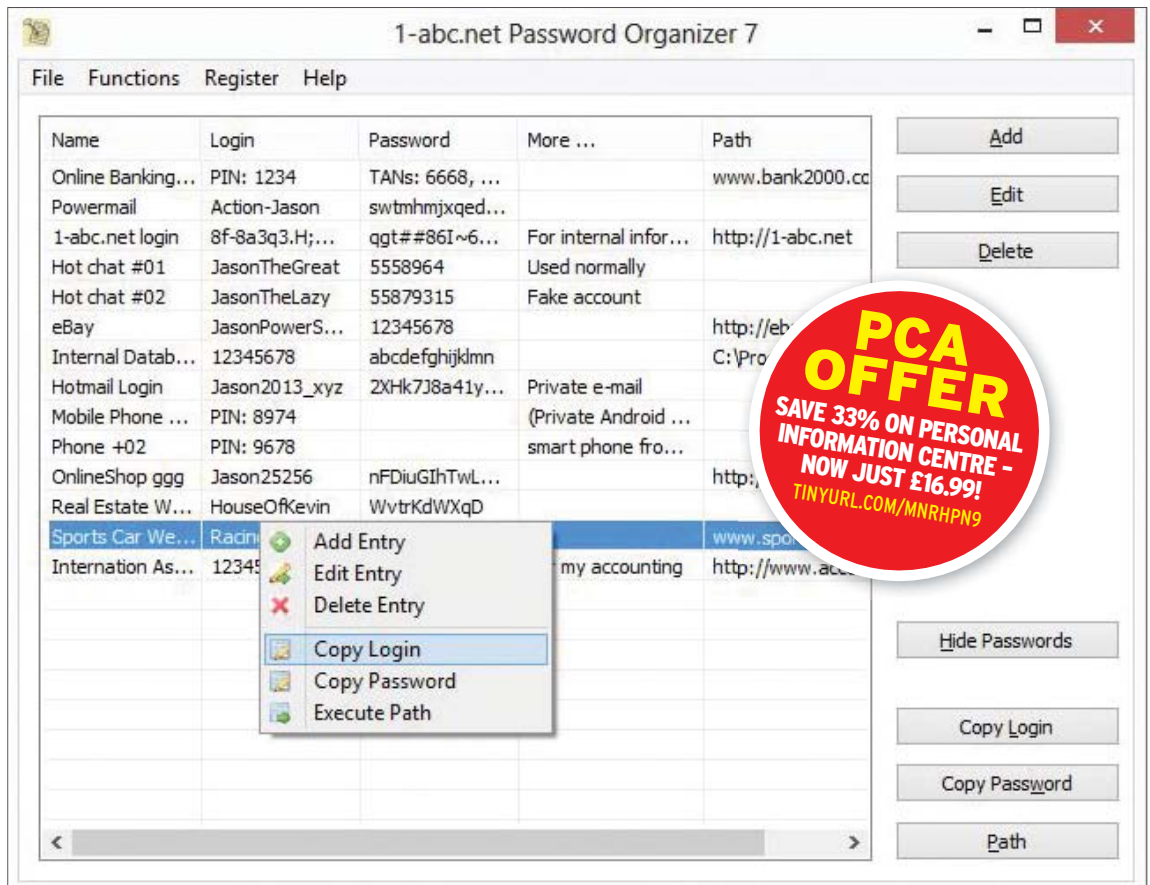
ONLINE
REGISTRATION
REQUIRED

Installation details

Go to My Computer. Right-click the disc icon, and open the disc. Select Files 230\ 1-abc.net Password Organiser 7 and open the install file

Online registration required: Head to tinyurl.com/cbcdosj before 14 Oct 2014

System requirements
Windows XP/Vista/7/8



These days everyone has many different passwords; for example, to log into a messenger or an email account, security codes for online banking, and so on. Password Organizer lets you organise all your passwords and login data, so you have to remember only a master password.

It's unadvisable to use, say, a family member's birthday or the name of your favourite sports team as a password, but anything else can be tricky to remember. 1-abc.net Password Organizer allows you to generate passwords on a random basis that no-one could guess.

If you want to have fast access to your password data, Password Organizer has yet more useful features. For example, it lets you define a path that can be executed in one click, such as an executable file or

your favourite program. You can also enter a website here, which would make sense if you would like to log in to any password-protected online service such as eBay or Twitter. And if you don't want to copy and paste your data each time you need it, you can also use global hotkeys.

Your passwords are protected by AES (Advanced Encryption Standard) encryption, so it's impossible to read your data without knowledge of your master password.

If you would like to export or print out all your passwords, 1-abc.net Password Organizer also offers this useful functionality.

Secure and generate your password data, remember just one password and concentrate on other important things in life with 1-abc.net Password Organizer! ☒

Abelssoft mp3 cutter 2014

FULL PROGRAM AVAILABLE ONLY ON THE DISC+

ONLINE
REGISTRATION
REQUIRED

Installation details

Go to My Computer.
Right-click the DVD
icon and open the disc.
Select Files 230\
Abelssoft mp3 cutter
2014 and open the
install file

**Online registration
required:** follow the
links during installation
before 14 Oct 2014

System requirements

Windows XP/Vista/7/8;
RAM: 512MB RAM; 50MB
hard disk space




Most music lovers manage their music collection in digital form as MP3 files. Abelssoft's mp3 cutter 2014 lets you remove squeaky spots from a track, cut out silence at the beginning or end of a track, and work with fade-in and fade-out effects.

Nowadays, vinyl records and CDs are stored in the attic. Instead, digital music is listened to almost everywhere in the house, saved as an MP3 file on a central server. Starting from here, the music can be copied to mobile devices, played on a PC or streamed to speakers.

For the MP3 generation, Abelssoft now provides the brand-new mp3 cutter app to easily edit MP3 files.

MP3 cutter 2014 loads an MP3 file and shows the saved music in a wave structure. It's not only possible to listen to the track, but to edit it easily, too.

The user can select specific areas with a mouse-click within the waveform and cut them out. It's easy to remove an annoying intro, as well as static noise or some seconds of silence at the start or end of a song. Furthermore, you can easily fade in or fade out parts. As an additional feature, with the plus-version two MP3 tracks can be merged to one file.

The result of the individual MP3 operation can be saved as a new MP3 file using the Export button. 

DISC INSTRUCTIONS

Place disc in drive. Open the file 'Click here to begin.pdf' for extra information.

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Ultraportable laptops



Sub-£500 laptops



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Tablets



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Blu-ray drives



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Printers



Projectors



Solid-state drives



Graphics cards



Flat-panel displays

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Prices

Laptops

Laptops up to £500
£501 to £1,000
£1,001 and over

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Printers under £150
£151 and over

Graphics cards

Graphics cards under £150
£151 and over

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Flat-panels under £200
£201 and over

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If you're interested in purchasing one of the products reviewed here then please contact the manufacturer or supplier directly, mentioning both *PC Advisor* and the issue in which you saw the product. If it won't supply the product as reviewed, contact us at jim_martin@idg.co.uk.

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Ultraportable laptops	    				
	1	2	3	4	5
	Apple MacBook Pro 13in Retina	Apple MacBook Air 13in	Acer Aspire S3-392G	Dell Latitude 14 7440	HP EliteBook 840 G1
Price	£1,499 inc VAT	£849 inc VAT	£900 inc VAT	£1,522 inc VAT	£1,344 inc VAT
Website	Apple.com/uk	Apple.com/uk	Acer.co.uk	Dell.co.uk	Hp.com/uk
Launch date	Feb 14	Apr 14	Jun 14	Jun 14	Apr 14
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2.6GHz Intel Core i5	1.4GHz Intel Core i5	1.6GHz Intel i5-4200U	2.1GHz Intel Core i7-4600U	2.1GHz Intel Core i7-4600U
RAM	8GB DDR3L	4GB DDR3L	4GB DDR3	8GB DDR3	8GB DDR3
Storage	512GB SSD	128GB SSD	500GB Hybrid	256GB SSD	500GB HDD
Screen size	13.3in glossy (anti-glare)	13.3in glossy (anti-glare)	13.3in gloss touchscreen	14in matt	14in matt
Screen resolution	2560x1600	1440x900	1920x1080	1920x1080	1920x1080
Graphics	Intel Iris Graphics	Intel HD Graphics 5000	nVidia GeForce 735M GT	Intel HD Graphics 4400	AMD Radeon HD 8750M
Video memory	N/A	N/A	1GB	N/A	1GB
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n	802.11a/b/g/n/ac	802.11b/g/n
Ethernet	Optional	Optional	10/100	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	2x USB 3.0	2x USB 3.0, 1x USB 2.0	3x USB 3.0	4x USB 3.0
FireWire	x	x	x	x	x
Thunderbolt	✓	✓	x	x	x
DisplayPort	x	✓	x	✓ (mini)	✓
HDMI	✓	x	✓	✓	x
DVI	x	x	x	x	x
VGA	x	x	x	x	✓
eSATA	x	x	x	x	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	HD webcam, multitouch trackpad, backlit keyboard	HD webcam, multitouch trackpad, backlit keyboard	None	None	720p webcam
Operating system	Mac OS X 10.9 Mavericks	Mac OS X 10.9 Mavericks	Windows 8.1 64-bit	Windows 7 64-bit	Windows 7 Pro 64-bit
Bundled software	iLife 11	iLife 11	Acer bundle	None	None
Fear (Max detail)	Not tested	Not tested	62/34.5fps	22fps	38fps (1080p)
Battery	71.8Wh lithium-polymer	54Wh lithium-polymer	36.4Wh lithium-polymer	47Wh lithium-ion	50Wh lithium-ion
Battery life	9 hrs 55 mins	12 hrs 57 mins	5 hrs	5 hrs 15 mins	6 hrs 25 mins
PC Mark 7 score	Not tested	4602	4282	4706	3100
Dimensions	314x219x18mm	325x227x4-17.5mm	324x255x18mm	337x232x21mm	339x237x21mm
Weight	1.57kg	1.35kg	1.65kg	1.63kg	1.58kg
Warranty	1-year return-to-base	1-year return-to-base	1-year return-to-base	3-year next-business-day	3-year return-to-base
FULL REVIEW	TINYURL.COM/M3TNC29	TINYURL.COM/KNXWZ3	TINYURL.COM/QFG00P	TINYURL.COM/QAH43KC	TINYURL.COM/L8HP79T

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Sub-£500 laptops	    				
	1	2	3	4	5
	Compaq CQ58-300sa	Asus X102BA	Toshiba CB30-102	Asus V550CA	Asus X552CL
Price	£230 inc VAT	£270 inc VAT	£250 inc VAT	£500 inc VAT	£500 inc VAT
Website	Saveonlaptops.co.uk	Asus.com/uk	Toshiba.co.uk	Asus.com/uk	Asus.com/uk
Launch date	Nov 13	May 14	Jun 14	Mar 14	Jun 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★☆☆	★★★☆☆	★★★★☆	★★★☆☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	1.4GHz AMD E1-200	1GHz AMD A4-1200	1.4GHz Intel Celeron 2955U	1.8GHz Intel Core i5-3337U	1.8GHz Intel i5-3337U
RAM	2GB DDR3	4GB DDR3L	2GB DDR3	6GB DDR3	6GB DDR3
Storage	320GB HDD	500GB HDD	16GB SSD	1TB HDD	750GB HDD
Screen size	15.6in glossy	10.1in glossy touchscreen	13.3in glossy	15.6in glossy touchscreen	15.6in glossy
Screen resolution	1366x768	1366x768	1366x768	1366x768	1366x768
Graphics	AMD Radeon HD 7310	AMD Radeon HD 8180	Intel HD Graphics	Intel HD 4000	nVidia GeForce GT 710M
Video memory	N/A	N/A	N/A	N/A	1GB
Wireless	802.11b/g/n	802.11b/g/n	802.11a/g/n	802.11b/g/n	802.11b/g/n
Ethernet	10/100	10/100	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✗
USB	3x USB 3.0	1x USB 3.0, 2x USB 2.0	2x USB 3.0	1x USB 3.0, 2x USB 2.0	2x USB 3.0
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	8x DVD ± RW	None	None	8x DVD ± RW	8x DVD ± RW
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Windows 8 64-bit	Windows 8 64-bit	Google Chrome OS	Windows 8 64-bit	Windows 8 64bit
Bundled software	None	MS Office Home & Student	None	Asus utilities	None
Battery	47Wh lithium-ion	33Wh lithium-ion	Lithium-polymer	44Wh lithium-ion	37Wh lithium-ion
Battery life	4 hrs 45 mins	4 hrs 20 mins	7 hrs 25 mins	3 hrs 25 mins	3 hrs 20 mins
PC Mark 7 score	1094	1100	N/A	2463	2700
Stalker (Low/High)	9fps (720p)	N/A	N/A	22fps	50fps (720p)
Dimensions	376x247x33mm	266x185x29mm	454x268x56mm	380x266x22mm	380x251x34mm
Weight	2.3kg	1.1kg	1.5kg	2.6kg	2.4kg
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
FULL REVIEW	TINYURL.COM/MT67W8X	TINYURL.COM/PLAUQCG	TINYURL.COM/LQEBYPA	TINYURL.COM/NQALWLF	TINYURL.COM/JWFOQJL






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	<div> <div>  <div>1</div> <div>PC ADVISOR RECOMMENDED</div> </div> <div>  <div>2</div> </div> <div>  <div>3</div> </div> <div>  <div>4</div> <div>PC ADVISOR RECOMMENDED</div> </div> <div>  <div>5</div> </div> </div>				
	HP Pavilion TouchSmart 15	Chillblast Defiant Mini 13	Dell Latitude 3340	Dell Latitude 3440	Toshiba Portégé R30-A-14K
Price	£650 inc VAT	£899 inc VAT	£590 inc VAT	£560 inc VAT	£900 inc VAT
Website	Hp.com/uk	Chillblast.com	Dell.co.uk	Dell.co.uk	Toshiba.co.uk
Launch date	May 14	Feb 14	Aug 14	Mar 14	Mar 14
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	1.6GHz Intel Core i5-4200U	3.4GHz Intel Core i7-4700MQ	1.6GHz Intel Core i5-4200U	1.6GHz Intel Core i5-4200U	2.4GHz Intel Core i3-4000M
RAM	8GB DDR3	8GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3
Storage	750GB HDD	1TB HDD	500GB HDD + 8GB NAND	500GB HDD	500GB HDD
Screen size	15.6in glossy touchscreen	13.3in matt	13.3in matt	14in matt	13.3in matt
Screen resolution	1366x768	1920x1080	1366x768	1366x768	1366x768
Graphics	GT 740M/Intel HD 4400	GTX 765M/Intel HD 4600	Intel HD Graphics 4400	Intel HD 4400	Intel HD Graphics 4600
Video memory	N/A	2GB	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/ac
Ethernet	10/100	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0, 1x USB 2.0	3x USB 3.0, 1x USB 2.0	2x USB 3.0	2x USB 3.0, 1x USB 2.0	3x USB 3.0
FireWire	x	x	x	x	x
Thunderbolt	x	x	x	x	x
DisplayPort	x	x	✓ (mini)	x	x
HDMI	✓	✓	✓	x	✓
DVI	x	x	x	x	x
VGA	✓	✓	✓	✓	✓
eSATA	x	x	x	x	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	8x DVD ±RW	None	None	8x DVD ±RW	None
Extras	Webcam	Webcam	720p webcam	Webcam	2Mp webcam
Operating system	Windows 8 64-bit	Windows 8 64-bit	Windows 8.1 Pro 64bit	Windows 8 64-bit	Windows 8.1 64bit
Bundled software	None	None	none	None	None
Stalker (720p/1080p)	60fps (720)	150/90fps	24fps (720p)	24fps	25fps (720p)
Battery	41Wh lithium-ion	62Wh lithium-ion	65Wh lithium-ion	40Wh lithium-ion	66Wh lithium-ion
Battery life	5 hrs 45 mins	4 hrs	10 hrs 30 mins	5 hrs 50 mins	8 hrs 4 mins
PCMark 7 score	2860	4720	3640	2699	2660
Dimensions	386x258x25mm	330x227x35mm	331x243x34mm	346x245x25mm	316x227x27mm
Weight	2.6kg	2.1kg	1.8kg	2kg	1.5kg
Warranty	1-year return-to-base	1-year return-to-base	1-year business	1-year business	3-year return-to-base
FULL REVIEW	TINYURL.COM/L2JAXH7	TINYURL.COM/PBZPA65	TINYURL.COM/Q3LFYQ6	TINYURL.COM/KQG023P	TINYURL.COM/K9Y86QS

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	<div> <div>  <div>1</div> <div>PC ADVISOR GOLD</div> </div> <div>  <div>2</div> </div> <div>  <div>3</div> </div> <div>  <div>4</div> </div> <div>  <div>5</div> </div> </div>				
	Apple 15in MacBook Pro Retina	Schenker XMG P304	Alienware 17	Toshiba Qosmio X70-A	Dell Precision M3800
Price	£1,699 inc VAT	£1,100 inc VAT	£1,699 inc VAT	£1,500 inc VAT	£1,926 inc VAT
Website	Apple.com/uk	Mysn.co.uk	Alienware.co.uk	Toshiba.co.uk	Dell.co.uk
Launch date	Mar 14	Aug 14	Aug 14	Mar 14	May 14
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2GHz Intel Core i7-4750HQ	2.2GHz Intel Core i7-4702MQ	2.4GHz Intel Core i7-4700MQ	2.4GHz Intel Core i7-4700MQ	2.2GHz Intel Core i7-4702HQ
RAM	8GB DDR3	8GB DDR3	8GB DDR3	16GB DDR3	16GB DDR3
Storage	256GB SSD	250GB SSD	1TB + 80GB SSD	1TB/256GB SSD hybrid	500GB + 256GB SSD
Screen size	15.4in glossy (anti-glare)	13.3in matt	17.3in anti-glare	17.3in glossy	15.6in glossy touchscreen
Screen resolution	2880x1800	1920x1080	1920x1080	1920x1080	3200x1880
Graphics	Intel Iris Pro	nVidia GeForce GTX 860M	nVidia GeForce GTX 880M	nVidia GeForce GTX 770M	nVidia Quadro K1100M
Video memory	128MB	2GB	8GB	3GB	2GB
Wireless	802.11a/b/n/ac, MIMO	802.11b/g/n/ac	802.11b/g/n	802.11b/g/n, WiDi	802.11ac, MIMO
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	None
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	3x USB 3.0, 1x USB 2.0	4x USB 3.0	2x USB 3.0, 2x USB 2.0	3x USB 3.0, 1x USB 2.0
FireWire	✓	✗	✗	✗	✗
Thunderbolt	✓	✗	✗	✗	✗
DisplayPort	✓	✗	✓ (mini)	✗	✓
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	None	None	None	None	None
Extras	Webcam	720p webcam	720p webcam	2Mp webcam	Webcam
Operating system	OS X Mavericks	Windows 8.1 64bit	Windows 8.1 64bit	Windows 8 64-bit	Windows 8 64-bit
Bundled software	Apple iLife	None	None	None	None
Stalker (720p/1080p)	62/57fps (Batman)	115fps (1080p)	150fps (1080)	50/43fps (Batman)	Not tested
Battery	958Wh lithium-polymer	62Wh lithium-ion	86Wh lithium-ion	47Wh lithium-ion	61- or 91Wh lithium-ion
Battery life	8 hrs 14 mins	5 hrs 5 mins	4 hrs 20 mins	3 hrs 5 mins	2 hrs 58 mins
PCMark7 score	N/A	5500	5600	6164	Not tested
Dimensions	359x247x18mm	374x250x37mm	414x299x48.5mm	418x273x44mm	372x254x18mm
Weight	2.02kg	2kg	4.2kg	3.4kg	1.9kg
Warranty	1-year return-to-base	2-year collect-and-return	1-year next day in-home	1-year European	1-year next business day
FULL REVIEW	TINYURL.COM/K3QSD9Y	TINYURL.COM/Q4JWVSM	TINYURL.COM/Q6DUD64	TINYURL.COM/P5BD3GB	TINYURL.COM/NTHYU44

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Tablets					
					
	1	2	3	4	5
	PC ADVISOR GOLD	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR GOLD	PC ADVISOR RECOMMENDED
	Google Nexus 7 (2013)	Apple iPad Air	Sony Xperia Z2 Tablet	Apple iPad mini (1st gen)	Google Nexus 10 by Samsung
Price	£199 inc VAT	£399 inc VAT	£399 inc VAT	£249 inc VAT	£319 inc VAT
Website	Play.google.com	Apple.com/uk	Sony.co.uk	Apple.com/uk	Play.google.com
Launch date	Jul 13	Oct 13	Apr 14	Nov 12	Nov 12
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Android 4.3 Jelly Bean	Apple iOS 7	Android 4.4.2 KitKat	Apple iOS 7	Android 4.4 KitKat
Screen size/resolution	7in/1280x800	9.7in/2048x1536	10.1in/1920x1200	7.9in/1024x768	10.1in/2560x1600
Storage/media card slot	16GB/none	16GB/none	16GB/none	16GB/none	16GB/none
Connectivity	802.11b/g/n, Bluetooth 4	802.11a/b/g/n, Bluetooth 4	802.11b/g/n/ac, Bluetooth 4	802.11b/g/n, Bluetooth 4	802.11b/g/n, Bluetooth 4, NFC
Processor	1.5GHz Snapdragon S4 Pro	Apple A7	2.3GHz Snapdragon 801	1GHz Apple A5	1.7GHz Cortex A-15
RAM	2GB	1GB	3GB	512MB	2GB
Claimed battery life	9 hrs	10 hrs	Not specified	10 hrs	9 hrs
Cameras (front/rear)	1.2/5Mp	1.2/5Mp	2.2/8.1Mp	1.2/5Mp	1.9/5Mp
Dimensions	114x200x8.7mm	169x240x7.5mm	266x172x6.4mm	135x200x7.2mm	178x264x8.9mm
Weight	299g	469g	439g	308g	603g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/QYUDY5C	TINYURL.COM/LSB84EE	TINYURL.COM/M8BZZUN	TINYURL.COM/CLJWUVS	TINYURL.COM/ARL2KDG

Tablets					
					
	6	7	8	9	10
	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	Sony Xperia Tablet Z	Advent Vega Tegra Note 7	LG G Pad 8.3	Lenovo Yoga Tablet 10	Tesco Hudl
Price	£339 inc VAT	£129 inc VAT	£199 inc VAT	£249 inc VAT	£119 inc VAT
Website	Sony.co.uk	Currys.co.uk	Lg.com/uk	Lenovo.com/uk	Tesco.com
Launch date	May 13	Nov 13	Feb 14	Jan 14	Sep 13
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Android 4.1 Jelly Bean	Android 4.3 Jelly Bean	Android 4.2 Jelly Bean	Android 4.2 Jelly Bean	Android 4.2 Jelly Bean
Screen size/resolution	10.1in/1920x1200	7in/1280x800	8.3in/1920x1200	10.1in/1280x800	7in/1440x900
Storage/media card slot	16GB/microSDXC	16GB/microSDHC	16GB/microSDHC	16GB/microSDXC	16GB/microSDHC
Connectivity	802.11a/b/g/n, Bluetooth 4	802.11b/g/n, Bluetooth 4	802.11a/b/g/n, Bluetooth 4	802.11b/g/n, Bluetooth 4	802.11a/b/g/n, Bluetooth 4
Processor	1.5GHz SnapDragon S4 Pro	1.9GHz nVidia Tegra 4	1.5GHz Snapdragon 600	1.2GHz ARM Cortex-A7	1.5GHz quad-core A9
RAM	2GB	1GB	2GB	1GB	1GB
Claimed battery life	10 hrs	10 hrs	8.5 hrs (actual)	18 hrs	9 hrs
Cameras (front/rear)	2.2/8.1Mp	0.3/5Mp	1.3/5Mp	1.6/5Mp	2/3Mp
Dimensions	172x266x6.9mm	120x190x10mm	127x217x8.3mm	261x181x8.1mm	129x193x9.9mm
Weight	495g	320g	338g	605g	370g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/ODTP6B8	TINYURL.COM/PMCO4H4	TINYURL.COM/N80BC7N	TINYURL.COM/KLV5SDM	TINYURL.COM/MXHXVUK

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Smartphones	1	2	3	4	5
	LG G3	LG G2	HTC One (M8)	Google Nexus 5	Sony Xperia Z2
Price	£499 inc VAT	£279 inc VAT	£550 inc VAT	£299 inc VAT	£599 inc VAT
Website	Lg.com/uk	Lg.com/uk	Htc.com/uk	Play.google.com	Sonymobile.com
Launch date	Jun 14	Sep 13	Apr 14	Oct 13	May 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Android 4.4.2 KitKat	Android 4.2 Jelly Bean	Android 4.4 KitKat	Android 4.4 KitKat	Android 4.4 KitKat
Processor	2.5GHz Snapdragon 801	2.26GHz Snapdragon 800	2.3GHz Snapdragon 801	2.3GHz Snapdragon 800	2.3GHz Qualcomm
Storage/media card slot	16GB/none	16GB/none	16GB/microSD	16GB/none	16GB/microSDXC
Screen size/resolution	5.2in/1440x2560	5.2in/1920x1080	5in/1920x1080	4.95in/1920x1080	5.2in/1920x1080
Screen type	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch
Connectivity	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	Bluetooth, NFC, Wi-Fi ac	HSPA+, Bluetooth, Wi-Fi ac	4G, NFC, Bluetooth, Wi-Fi
Claimed battery life	Not specified	Not specified	Not specified	17 hrs/300 hrs	17 hrs/740 hrs
Cameras (front/rear)	13Mp, 1080p video	13Mp, 1080p video	5Mp, 1080p video	8Mp, 1080p video	20.7Mp, 1080p video
GPS	A-GPS	A-GPS	A-GPS, Glonass	A-GPS	A-GPS
Dimensions, weight	75x146x8.9mm, 149g	71x139x9.4mm, 143g	146.4x70.6x9.4mm, 160g	69x138x8.9mm, 130g	146.8x73.3x8.2mm, 163g
Warranty	1 year	1 year	2 years	1 year	1 year
FULL REVIEW	TINYURL.COM/MQ8DHUU	TINYURL.COM/PAFK4SZ	TINYURL.COM/NGBWX9	TINYURL.COM/PAFK4SZ	TINYURL.COM/NXB5SWV

Smartphones	6	7	8	9	10
	Sony Xperia Z1 Compact	Sony Xperia Z1	Apple iPhone 5s	Huawei Ascend P7	Samsung Galaxy S5
Price	£401 inc VAT	£430 inc VAT	£549 inc VAT	£399 inc VAT	£549 inc VAT
Website	Sonymobile.com	Sonymobile.com	Apple.com/uk	Huawei.com/uk	Samsung.com/uk
Launch date	Jan 14	Jul 13	Sep 13	May 14	Apr 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Android 4.3 Jelly Bean	Android 4.2 Jelly Bean	Apple iOS 7	Android 4.4.2 (KitKat)	Android 4.4.2 (KitKat)
Processor	2.2GHz Snapdragon 800	2.26GHz Snapdragon 800	1.3GHz Apple A7	1.8GHz Hisilicon Kirin 910T	2.5GHz Snapdragon 801
Storage/media card slot	16GB/microSDXC	16GB/microSDXC	16GB/none	16GB/none	32GB/microSD
Screen size/resolution	4.3in/1280x720	5in/1920x1080	4in/640x1136	5in/1920x1080	5.1in/1920x1080
Screen type	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch
Connectivity	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	NFC, Wi-Fi, Bluetooth, Micro-USB	4G, Bluetooth, Wi-Fi
Claimed battery life	18 hrs/670 hrs	14 hrs/880 hrs	10 hrs/250 hrs	Not specified	21 hrs/390 hrs
Cameras (front/rear)	20.7Mp, 1080p video	20.7Mp, 1080p video	8Mp, 1080p video	13Mp, 8Mp	2Mp, 16Mp
GPS	A-GPS	A-GPS	A-GPS, Glonass	A-GPS, Glonass	GPS, Glonass
Dimensions, weight	127x64.9x9.5mm, 137g	144x74x8.5mm, 169g	59x124x7.6mm, 112g	139.8x68.8x8mm, 124g	73x142x8.1mm, 145g
Warranty	1 year	1 year	1 year	Not specified	2 years
FULL REVIEW	TINYURL.COM/KAU7DYR	TINYURL.COM/NJPM4DE	TINYURL.COM/MZ8JHLF	TINYURL.COM/OZPOYFN	TINYURL.COM/KDVCTST

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Gaming PCs	 1 	 2	 3 	 4	 5
	Chillblast Fusion Probe	Gladiator Firestorm OC	CyberPower Infinity Perseus XT	Computer Planet GX 760	Yoyotech Warbird RS2
Price	£1,299 inc VAT	£695 inc VAT	£1,499 inc VAT	£983 inc VAT	£1,370 inc VAT
Website	Chillblast.com	Gladiatorpc.co.uk	Cyberpowersystem.co.uk	Computerplanet.co.uk	Yoyotech.co.uk
Launch date	Feb 14	Mar 14	Feb 14	Mar 14	Feb 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★★	★★★★☆
Features rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★★
Performance rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★★
Value rating	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★☆☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★★
Processor	3.4GHz Intel Core i5-4670K (OC 4.4GHz)	3.4GHz Intel Core i5-4670K (OC 4.2GHz)	3.4GHz Intel Core i5-4670K (OC 4.4GHz)	3.4GHz Intel Core i5-4670K	3.5GHz Intel Core i7-4770K (OC 4.3GHz)
CPU cooler	Corsair H55 Liquid Cooler	Be Quiet Dark Rock 3	Cooler Master Seldon 120mm	Corsair H60 Hydro	Corsair H80 cooler
Memory	16GB DDR3	8GB DDR3	16GB DDR3	8GB DDR3	8GB DDR3
Storage	120GB SSD + 2TB HDD	2TB HDD	256GB SSD + 2TB HDD	120GB SSD + 2TB HDD	128GB SSD + 1TB HDD
Power supply	750W Corsair	500W Corsair	750W Corsair	450W Corsair	600W Cooler Master
Motherboard	Gigabyte GA-Z87N-Wi-Fi	MSI Z87M Gaming	Gigabyte GA-Z87-HD3	Gigabyte GA-Z87N-Wi-Fi	MSI Z87M-G43
Operating system	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Screen	23.6in Iiyama X2377HDS	None supplied	23in AOC i2367fh	None supplied	23in AOC i2369vm
Graphics	Palit Jetstream GeForce GTX 780, 3GB VRAM	MSI nVidia GeForce GTX 750 Ti Gaming, 2GB VRAM	Powercolor AMD R9 290, 4GB VRAM	Zotac GeForce GTX 760, 2GB VRAM	Asus GTX 760 DirectCU II OC, 2GB VRAM
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Connectivity	Gigabit ethernet, 802.11n	Low-lag ethernet	Gigabit ethernet	2x gigabit ethernet, 802.11n	Gigabit ethernet
Ports	6x USB 3.0, 4x USB 2.0	8x USB 3.0, 4x USB 2.0, 2x eSATA	6x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0	4x USB 3.0, 6x USB 2.0
Optical drive	DVD±RW (Blu-ray optional)	24x DVD±RW	DVD±RW, BD-ROM	None supplied	DVD±RW
Case	Aerocool Dead Silence Gaming Cube	Aerocool Dead Silence Cube Window Red	Cooler Master Dominator 690 III	Fractal Design Node 304	AerocoolDS Cube Red with window
Keyboard & mouse	Gigabyte M6800 mouse, Force K3 keyboard	None	Gigabyte M6900 mouse, Force K3 keyboard	None	Powercool JM-9032U mouse, KB-768 keyboard
Other	Optional family pack	None	None	None	None
PC Mark 7 score	6965	5124	6731	5508	6424
Alien vs Predator score (720p/1080p)	169/93fps	103/54fps	172/96fps	103/54fps	161/88fps
Final Fantasy XIV (720p/1080p)	218/96fps	N/A	167/87fps	N/A	228/95fps
Sniper Elite V2 (Low/High/Ultra)	308/187/49fps	194/81.6/18.6fps	352/155/39fps	261/119/29fps	349/180/46fps
Power Consumption	52/407W	70W/166W	68/484W	53W/271W	81/370W
Warranty	2-year collect-and-return	4-year return-to-base	3-year RTB (2 years parts, 3 years labour)	3-year return-to-base	3-year Silver (1-year parts, 3 years labour)
FULL REVIEW	TINYURL.COM/OWQ24QQ	TINYURL.COM/PKDV2NG	TINYURL.COM/NKWN7V4	TINYURL.COM/MJZKS7G	TINYURL.COM/PMWPELY

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Mini PCs	 1 PC ADVISOR BEST BUY	 2 PC ADVISOR RECOMMENDED	 3	 4	 5
	Yoyotech Warbird RS4.0	Chillblast Fusion Xcalibur	Mesh Elite Mini Gaming OC	Dino PC Microraptor GTX 770	Quiet PC Serenity Nano
Price	£999 inc VAT	£849 inc VAT	£1,499 inc VAT	£999 inc VAT	£1,238 inc VAT
Website	yoyotech.co.uk	chillblast.com	meshcomputers.com	dinopc.com	quietpc.co.uk
Launch date	Mar 14	Mar 14	Mar 14	Mar 14	Mar 14
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.4GHz Intel Core i5-4670K	3.2GHz Intel Core i5-4570	3.5GHz Intel Core i7-4770K (4.3GHz OC)	3.4GHz Intel Core i5-4670K (4.3GHz OC)	3.4GHz Intel Core i5-4670K (3.8GHz OC)
CPU cooler	Noctua L9i low-profile cooler	Scythe Shuriken low-profile cooler	Corsair Hydro Series H60 liquid cooler	Corsair Hydro Series H80 liquid cooler	Noctua L9i low-profile cooler
RAM	8GB DDR3 1600MHz	8GB DDR3 1600MHz	16GB DDR3 2133MHz	16GB DDR3 1600MHz	16GB DDR3 1600MHz
Storage	128GB SSD, 2TB HDD	120GB SSD, 1TB HDD	240GB SSD, 2TB HDD	128GB SSD, 1TB HDD	120GB SSD, 2TB HDD
Power supply	Seasonic Evo 520W Bronze-rated	450W Silverstone SFX	750W Cooler Master GX RS-750	600W Corsair Builder Series CX600	FSP Aurum 750W modular PSU
Motherboard	Asus Z87I-Pro	Asus H81I-PLUS	MSI Z87I Gaming AC	Gigabyte GA-Z87N-WIFI	Gigabyte H87N-WIFI
Operating system	Windows 8.1	Windows 8.1/7 Home Premium	Windows 8.1	Windows 8.1	Windows 8.1
Graphics	Asus GTX 770 (2GB)	EVGA GTX 760 (2GB)	AMD Radeon R9 290X (4GB)	Zotac nVidia GeForce GTX 770 (2GB)	Palit GTX 770 Jetstream (2GB)
Networking	Gigabit ethernet, 802.11n Wi-Fi	Gigabit ethernet, 802.11n Wi-Fi	Gigabit ethernet, 802.11n Wi-Fi	2x gigabit ethernet, 802.11n Wi-Fi	Gigabit ethernet, 802.11n Wi-Fi
USB ports	6x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0	6x USB 3.0, 3x USB 2.0	5x USB 3.0, 4x USB 2.0
Other ports	3x DVI (2x DVI-I), 2x HDMI, 2x DisplayPort	2x DVI, HDMI, DisplayPort	3x DVI, 2x HDMI, 2x DisplayPort, eSATA	1x DVI, 2x HDMI, 1x PS/2	2x DVI, HDMI, DisplayPort
Optical drive	Pioneer BDR-S07XLT Blu-ray writer	Optional	External Blu-ray drive	LiteOn iHAS122 DVD writer	Optional
Case	Cooler Master Elite 130	Silverstone RVZ01	Fractal Design Node 304	Cooler Master Elite 130	Cooler Master Elite 130
Keyboard & mouse	None	Logitech MK520	None	None	None
PCMark 8 score	6403	6334	6678	6861	6403
Alien vs Predator score (720p/1080p)	127/68	104/56	186/104	121/65	127/68
Sniper V2 Elite score (Low/High/Ultra)	303/161/40	263/124/31	387/169/43	313/150/38	303/161/40
Games score (Final Fantasy XIV)	200/76	155/63	183/94	220/81	200/76
Power consumption (idle/max)	49/330W	39/278W	54/548W	71/384W	49/330W
Warranty	3-year Silver (1-year parts, 3-year labour)	2-year Collect and Return (5-year labour)	3-year collect-and-return (2-year parts, 3-year labour)	3-year return-to-base (1-year parts, 3-year labour)	2-year collect-and-return
FULL REVIEW	TINYURL.COM/MQ8POPOQ	TINYURL.COM/NFQ6EGO	TINYURL.COM/PWCACV2	TINYURL.COM/MXMJ6QT	TINYURL.COM/O4QDHTY

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All-in-one PCs	1 	2 	3 	4 	5 
	Dell XPS 2720	Apple iMac 27in (Late 2012)	Medion Akoya P2002	Chillblast Fusion AIO Ultima	MSI Wind Top AE2712G
Price	£1,749 inc VAT	£1,699 inc VAT	£449 inc VAT	£1,199 inc VAT	£1199 inc VAT
Website	Dell.co.uk	Apple.com/uk	Medion.com/gb	Chillblast.com	Uk.msi.com
Launch date	Sep 13	Sep 13	Sep 13	Sep 13	Sep 13
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.1GHz Intel Core i7-4770S	3.2GHz Intel Core i5-3470	3.3GHz Intel Core i3-3220	3.1GHz Intel Core i7-3770S	2.9GHz Intel Core i5-3470S
RAM	16GB DDR3	8GB DDR3	4GB DDR3	16GB DDR3	4GB DDR3
Storage	2TB HDD + 32GB SSD	1TB HDD	1TB HDD	1TB HDD + 120GB SSD	1TB HDD
Screen	27in IPS touchscreen	27in IPS	23.6in TN	21.5in IPS touchscreen	27in TN touchscreen
Screen resolution	2560x1440	2560x1440	1920x1080	1920x1080	1920x1080
Graphics card	nVidia GeForce GT 750M	nVidia GeForce GTX 675MX	Intel HD Graphics 2500	Intel HD Graphics 4000	nVidia GeForce GT 630M
Video memory	2GB	1GB	N/A	N/A	2GB
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	6x USB 3.0	4x USB 3.0	2x USB 3.0, 4x USB 2.0	4x USB 3.0, 2x USB 2.0	2x USB 3.0, 4x USB 2.0
FireWire	✗	✗	✗	✗	✗
Thunderbolt	✓	✓	✗	✗	✗
HDMI	✓	✗	✓	✓	✓
Media card slot	✓	✓	✓	✓	✓
Optical drive	Blu-ray combo drive	None	DVD drive	Blu-ray combo drive	Blu-ray combo drive
Other	2.1Mp webcam, wireless keyboard and mouse, dual digital microphone array	1.3Mp webcam, wireless keyboard and mouse	Wireless keyboard and mouse, CyberLink software, Kaspersky Internet Security	Webcam, Microsoft Wireless Desktop 3000	2Mp webcam, DVB-T TV tuner, wireless keyboard and mouse, CyberLink software
Operating system	Windows 8	Mac OS X 10.9 Mavericks	Windows 8	Windows 8	Windows 8
Power consumption (idle/max)	54/84/220W	53/84/243W	34/42/92W	32/40/119W	44/53/110W
Sniper V2 Elite (Low/High/Ultra)	6/25/94fps	12/54/197fps	5/5/16fps	5/7/28fps	5/6/17fps
PCMark 7 score	6091	4141	3298	5195	3138
Dimensions	492x664x72mm	650x203x516mm	580x196x430-460mm	338x541x61mm	672x483x66mm
Weight	16kg	9.5kg	10.3kg	9kg	13kg
Warranty	1-year next-day in-home	1-year return-to-base	1-year return-to-base	2-year collect-and-return	2-year collect-and-return
FULL REVIEW	TINYURL.COM/KWZ4KLL	TINYURL.COM/A95Q9VY	TINYURL.COM/MEVSJ9D	TINYURL.COM/LQ4U8FW	TINYURL.COM/MUGFKQ7

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Business PCs	 1	 2	 3	 4	 5
	Aria Gladiator Logic N200-3220M	Chillblast Fusion Opal	Wired2Fire Business Accelerate	Dino PC Synergy 4430	Eclipse Precision A856F85
Price	£509 inc VAT	£549 inc VAT	£689 inc VAT	£569 inc VAT	£519 inc VAT
Website	Aria.co.uk	Chillblast.com	Wired2fire.co.uk	Dinopc.com	Eclipsecomputers.com
Launch date	Aug 13	Aug 13	Aug 13	Aug 13	Aug 13
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.3GHz Intel Core i3-3220 (dual-core)	3.2GHz Intel Core i5-4570 (quad-core)	3.4GHz Intel Core i5-4670 (quad-core)	3GHz Intel Core i5-4430 (quad-core)	3.6GHz AMD Trinity A8-5600K (quad-core)
RAM	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3
Storage	500GB HDD + 80GB SSD	1TB HDD	120GB SSD	1TB HDD	1TB HDD
Motherboard	Gigabyte GA-B75M-D3H	Asus B85M-G	ASRock B85M-HDS	Gigabyte GA-H87M-HD3	Asus F2A85-M LE
CPU cooler	Arctic Cooling Alpine 11 GT Quiet	Standard Intel cooler	Standard Intel cooler	Standard Intel cooler	Standard AMD cooler
Power supply	Corsair 430W	CiT 500W	Xigmatek 400W	CiT 500W	Alpine 600W
Screen	21.5in AOC E2260SWDA	23.6in Iiyama X2377	2x 21.5in AOC E2260SWDA	23in Iiyama XB2380HS-B1	23in AOC i2369Vm
Screen resolution	1920x1080	1920x1080	1920x1080	1920x1080	1920x1080
Graphics	Intel HD Graphics 2500	Intel HD Graphics 4600	Intel HD Graphics 4600	Intel HD Graphics 4600	Integrated
Video memory	N/A	N/A	N/A	N/A	N/A
USB	2x USB 3.0, 4x USB 2.0	3x USB 3.0, 6x USB 2.0	2x USB 3.0, 8x USB 2.0	4x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	Not specified	Not specified	Not specified	Not specified	Not specified
Case	Cooler Master N200	CiT Fortress	In-Win Em040	CiT Templar	K2 Gamer
Keyboard	Microsoft Desktop 400 keyboard and mouse (wired)	Cherry J82-16001 keyboard, M-5450 mouse (wired)	Gigabyte K6800 keyboard, M6800 mouse (wired)	Logitech K120 keyboard, B110 mouse (wired)	Microsoft Optical Desktop 800 (wired)
Optical drive	24x DVD±RW	24x DVD±RW	DVD±RW	Samsung DVD±RW	Samsung DVD±RW
Operating system	Windows 7 Home Premium 64-bit	Windows 8 Professional	Windows 7 Professional 64-bit	Windows 7 Home Premium 64-bit	Windows 8 Professional
Bundled software	None	None	None	None	None
PCMark 7 overall score	3524	4257	5667	3458	2349
PCMark 7 Productivity score	4056	2685	5929	2529	1883
PCMark 7 Computational score	3321	21490	13651	9377	3899
Power consumption (idle/max)	27/69W	47/124W	37/135W	37/115W	34/145W
Warranty	1-year return-to-base, phone support	2-year collect-and-return, phone support	2-year return-to-base, phone support	3-year return-to-base, phone support	1-year return-to-base, phone support
FULL REVIEW	TINYURL.COM/OSW55A8	TINYURL.COM/KGGE98T	TINYURL.COM/PCSKWVS	TINYURL.COM/PF8LUXD	TINYURL.COM/MQFWJ3R

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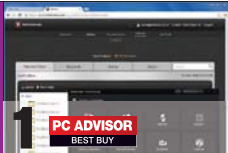
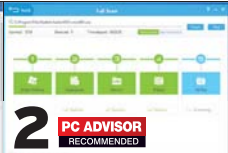
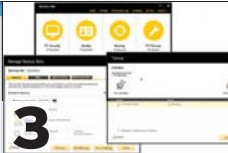


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Prices are correct at time of going to press (27-06-14) E&OE






* Chillblast won more awards in the leading IT press publications PC Pro, PC Advisor and Computer Shopper combined than any other retailer 2010-2013

** World's fastest PC as tested by PC Pro Magazine - <http://www.pcpro.co.uk/reviews/desktops/371152/chillblast-fusion-photo-oc-iv>






Family PCs	 1 PC ADVISOR BEST BUY	 2 PC ADVISOR RECOMMENDED	 3	 4	 5
	Chillblast Fusion Commando	Quiet PC Serenity Home Value	Dino PC Raging Lizard	CyberPower Ultra Scylla SE III	Computer Planet F2000
Price	£799 inc VAT	£696 inc VAT	£899 inc VAT	£699 inc VAT	£930 inc VAT
Website	Chillblast.com	Quietpc.com	Dinopc.com	Cyberpowersystem.co.uk	Computerplanet.co.uk
Launch date	Jul 13	Jul 13	Jul 13	Jul 13	Jul 13
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.2GHz Intel Core i5-4570	2.9GHz Intel Core i5-3475S	3.2GHz Intel Core i5-4570	4.2GHz AMD FX 4350	3.4GHz Intel Core i5-3570
RAM	16GB DDR3	16GB DDR3	16GB DDR3	8GB DDR3	8GB DDR3
Storage	1TB HDD + 120GB SSD	500GB HDD hybrid SSD	1TB HDD + 128GB SSD	2TB HDD	2TB HDD + 120GB SSD
Motherboard	Asus B85M-G	Gigabyte GA-H61M-USB3V	Gigabyte GA-Z87M-HD3	Asus M5A78L-M/USB3	Gigabyte B75M-D3H
CPU cooler	Arctic Cooling Freezer 7 Pro	Standard Intel cooler	Standard Intel cooler	Standard AMD cooler	Arctic Cooling Freezer 7 Pro
Power supply	600W C1T	Zalman ZM450-GS 450W	Corsair VS450 450W	Cooler Master 500W	Cooler Master GX 600W
Screen	23in Iiyama X2377	Not supplied	23in AOC i2369Vnm	24in BenQ GL2450E	23.6in Iiyama X2377
Screen resolution	1920x1080	N/A	1920x1080	1920x1080	1920x1080
Graphics	Zotac nVidia GeForce GTX 650 Ti	Intel HD Graphics 4000	Gigabyte nVidia GeForce GTX 650 Ti	MSI AMD Radeon HD 7770	Gainward nVidia GeForce GTX 660
Video memory	N/A	N/A	N/A	1GB	2GB
Connectivity	802.11b/g/n, gigabit ethernet	802.11b/g/n, gigabit ethernet	802.11b/g/n, gigabit ethernet	802.11b/g/n, gigabit ethernet	802.11b/g/n, gigabit ethernet
USB	3x USB 3.0, 6x USB 2.0	2x USB 3.0, 6x USB 2.0	6x USB 3.0, 2x USB 2.0	2x USB 3.0, 6x USB 2.0	2x USB 3.0, 7x USB 2.0
Media card slot	None	None	Yes	Yes	Yes
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	2x Logitech LS220	None	None	None	None
Case	Cooler Master Force 500	Zalman ZM-T1	Xigmatek Asgard 382	Cooler Master Elite 430	Cooler Master Elite 335U
Keyboard	Logitech MK260	Gigabyte GK-KM7580	Logitech MK260	Logitech MK330	Logitech MK260
Optical drive	LG BD-ROM/DVD±RW	Sony DVD±RW	BD-ROM, DVD±RW	Lite-On BD-ROM/DVD±RW	TSSTcorp 24x DVD±RW
Operating system	Windows 8 64-bit	Windows 8 64-bit	Windows 8 64-bit	Windows 8 64-bit	Windows 8 64-bit
Bundled software	None	None	None	None	None
Sniper V2 Elite score (Low/High/Ultra)	147/59/14fps	26/7/5fps	154/62/14fps	130/43/9fps	205/59/15fps
Alien vs Predator score (720p/1080p)	52/27fps	8/5fps	53/27fps	47/24fps	77/41fps
PCMark 7 score	6177	4464	6282	2957	6134
Warranty	2-year collect-and-return	2-year collect-and-return	3-year return-to-base	3-year return-to-base (1 year parts)	2-year return-to-base, 1-year collect-and-return
FULL REVIEW	TINYURL.COM/KF6G3T7	TINYURL.COM/KPE3BAD	TINYURL.COM/RAGLIZ	TINYURL.COM/QHT5X2H	TINYURL.COM/NEVWQ4U






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Internet security software	    				
	1	2	3	4	5
	Bitdefender Total Security	Qihoo 360 IS 4.3	Symantec Norton 360 2014	Kaspersky Pure 3.0 TS	Gdata TotalProtection 2014
Price	£55 inc VAT	Free	£60 inc VAT	£60 inc VAT	£50 inc VAT
Website	Bitdefender.co.uk	360safe.com	Norton.com/uk	Kaspersky.co.uk/pure	Gdatasoftware.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Number of devices	3	Unlimited	3	3	3
Length of licence	1 year	1 year	1 year	1 year	1 year
Portable support	Android	Android	Android	Android	Android
Anti-malware	✓	✓	✓	✓	✓
Anti-spam	✓	x	✓	✓	✓
Firewall	✓	x	✓	✓	✓
Parental control	✓	x	✓	✓	✓
Online storage	2GB	N/A	2GB	2GB	N/A
50GB AV scan time	140 mins (1.39M files)	39 mins (68,100 files)	20 mins (176,000 files)	81 mins (334,000 files)	32 mins (8,800 files)
Scan rate (files/sec)	166	29	148	69	5
1GB copy with/without AV	41/48 secs	45/55 secs	43/69 secs	44/71 secs	52/54 secs







Antivirus	    				
	1	2	3	4	5
	Norton AntiVirus	Bitdefender Antivirus Pro	G Data AntiVirus	Kaspersky Anti-Virus	Trend Micro Titanium AV+
Price	£39 inc VAT	£24 inc VAT	£34 inc VAT	£39 inc VAT	£39 inc VAT
Website	Norton.com	Bitdefender.co.uk	Gdatasoftware.com	Kaspersky.co.uk	Uk.trendmicro.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Number of devices	3	3	3	3	3
Length of licence	1 year	1 year	1 year	1 year	1 year
Signature-based detection	98.7%	97.5%	99.4%	95.7%	98.4%
Malware blocking (full)	96%	68%	84%	88%	88%
Malware blocking (partial)	0%	20%	4%	4%	8%
Clean-up of active malware	80%	80%	80%	80%	80%
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








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Sub-£150 printers	1	2	3	4	5
					
	Samsung Xpress M2070W	Canon Pixma MG5550	Brother MFC-J870DW	Brother HL-1110	HP Photosmart 7520
Price	£110 inc VAT	£75 inc VAT	£137 inc VAT	£59 inc VAT	£122 inc VAT
Website	Samsung.com/uk	Canon.co.uk	Brother.co.uk	Brother.co.uk	Hp.com/uk
Launch date	Mar 14	Apr 14	Jul 14	Jun 14	Jan 13
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Technology	Mono laser	Colour inkjet	Colour inkjet	Mono laser	Colour inkjet
Max print resolution	1200x1200	4800x1200dpi	6000x1200dpi	600x600dpi	9600x2400
Actual print speed	B=17.1ppm	B=11.8ppm C=8.7ppm	B=18ppm C=11ppm	B=16.4ppm	B=17.6ppm C=7.9ppm
Scan/fax facilities	1200x1200 scans	1200x2400 scans	1200x2400 scans	None	1200x2400 scans
Supported interfaces	USB 2.0, 802.11b/g/n, NFC	USB 2.0, 802.11b/g/n	USB 2.0, 802.11b/g/n, NFC	USB 2.0	USB 2.0, 802.11b/g/n, HP ePrint
Cost per page	B=3.8p	B=2.4p C=4.8p	B=3.9p C=2.5p	B=2.7p	B=2.4p C=4.8p
Media card/auto duplex	xx	x✓	✓✓	xx	✓✓
Input capacity	150 sheets	100 sheets	150 sheets + 20 ADF	150 sheets	125 sheets + 20 tray + 25 ADF
Dimensions	406x360x253mm	455x369x148mm	410x374x180mm	340x238x189mm	454x551x220mm
Weight	7.4kg	6.3kg	9.5kg	4.5kg	8.6kg
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/OYZKJKE	TINYURL.COM/LKWLJDE	TINYURL.COM/M52V29R	TINYURL.COM/QE9GLNF	TINYURL.COM/98G9XTE

£151+ printers	1	2	3	4	5
					
	Canon i-Sensys MF6180dw	HP OfficeJet Pro X551dw	Kyocera Ecosys P6030cdn	Kyocera Ecosys M2030dn	Canon i-Sensys LBP7780Cx
Price	£380 inc VAT	£435 inc VAT	£560 inc VAT	£340 inc VAT	£456 inc VAT
Website	Canon.co.uk	Hp.com/uk	Kyoceradocumentsolutions.co.uk	Kyoceradocumentsolutions.co.uk	Canon.co.uk
Launch date	May 14	Aug 13	Jul 14	May 14	Jun 13
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Technology	Mono laser	Colour inkjet	Colour laser	Mono laser	Colour laser
Max print resolution	1200x600dpi	2400x2400	9600x600dpi	1800x600dpi	9600x600
Actual print speed	B=24ppm	B=42.9ppm C=15.8ppm	B=27ppm C=27ppm	B=28ppm	B=23.2pp C=16.7ppm
Scan/fax facilities	600dpi scanner, 33.6Kbps fax	None	None	600dpi scanner	None
Supported interfaces	USB 2.0, ethernet, 802.11b/g/n	USB 2.0, ethernet, 802.11b/g/n	USB 2.0	USB 2.0, gigabit	USB 2.0, ethernet
Cost per page	B=1.5p	B=1p C=4.3p	B=1.2p C=1.7p	B=2.2p	B=1.3p C=7.5p
Media card/auto duplex	x✓	x✓	x✓	✓✓	x✓
Input capacity	250 + 50 sheet + 50 ADF	500 + 50 sheet	500 sheets + 150 (2150 max)	250 sheets + 50 sheet	500 + 100 sheets
Dimensions	390x473x431mm	517x399x414mm	345x518x480mm	494x430x448mm	517x530x401mm
Weight	19.1kg	17.1kg	29.5kg	18kg	31kg
Warranty	1 year	1 year	2 years	2 years	1 year
FULL REVIEW	TINYURL.COM/LE9WA5N	TINYURL.COM/CZ05P65	TINYURL.COM/N4MCYLF	TINYURL.COM/NRLNSZW	TINYURL.COM/CCAPAJF

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Blu-ray drives					
	1	2	3 	4	5
	Pioneer BDR-209EBK Retail	Pioneer BDR-209DBK OEM	LG BH16NS40	LG BP40NS20	Lite-On IHES112-115
Price	£61 inc VAT	£57 inc VAT	£70 inc VAT	£90 inc VAT	£54 inc VAT
Website	Pioneer.eu/uk	Pioneer.eu/uk	Uk.lge.com	Uk.lge.com	Liteonit.eu
Launch date	Nov 13	Nov 13	May 12	Jan 13	Oct 12
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Blu-ray speeds	16x -R, 14x -R DL, 2x -RE, 12x -ROM	16x -R, 14x -R DL, 2x -RE, 12x -ROM	16x -R, 12x -R DL, 12x -RE, 12x -ROM	6x -R, 6x -R DL, 2x -RE, 6x -ROM	12x -ROM
DVD speeds	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 16x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 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	8x ±R, 8x ±R DL, 6x -RW, 8x +RW, 8x -ROM
Max storage	128GB	50GB	50GB	100GB	8.5GB
Interface type	SATA (internal)	SATA (internal)	SATA (internal)	USB 2.0 (external)	SATA (internal)
Label technology	None	None	LightScribe	None	None
Software	ArcSoft TotalMedia Extreme	None	CyberLink Blu-ray Suite	PowerDVD, PowerProducer	None
Dimensions	148x180x42mm	148x180x42mm	146x170x41mm	160x153x22mm	158x145x22mm
Weight	740g	740g	749g	380g	700g
Warranty	1 year	1 year	1 year	1 year	2 years
FULL REVIEW	TINYURL.COM/LD47X7K	TINYURL.COM/LD47X7K	TINYURL.COM/8YTUJEF	TINYURL.COM/BS8UAFF	TINYURL.COM/8SYECMW

Wireless routers					
	1 	2	3 	4 	5
	Apple AirPort Extreme	AVM FRITZ!Box 7490	TP-Link Archer C7	Asus RT-AC68U AC1900	TP-Link TL-WDR4900
Price	£169 inc VAT	£245 inc VAT	£90 inc VAT	£150 inc VAT	£80 inc VAT
Website	Apple.com/uk	Fritzbox.eu	Tp-link.com	Uk.asus.com	Tp-link.com
Launch date	Jan 14	Jul 14	Jan 14	Jan 14	Dec 13
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Standards supported	802.11b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n
Frequency modes	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)
Antennae	6x internal	3x3 MIMO	3x external, 3x internal	3x external, 3x internal	3x external, 3x internal
128bit/256bit WEP	✓ x	✓ x	✓ x	✓ x	✓ x
Modem/Parental Control	x✓	✓✓	x✓	x✓	x✓
Firewall	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI
Ports	Gigabit WAN, 3x gigabit LAN, USB	4x gigabit LAN, 2x USB	Gigabit WAN, 4x gigabit LAN, 2x USB	Gigabit WAN, 4x gigabit LAN, 2x USB	10/100 WAN, 4x 10/100 LAN, 2x USB
Average power use	Not tested	Not tested	Not tested	Not tested	Not tested
Throughput (near, far, ac)	124, 105, 578/540Mbps	130, 109, 330/125Mbps	110, 89, 505/468Mbps	98, 69, 610/570Mbps	127, 111Mbps, N/A
Dimensions, weight	98x168x98mm, 945g	245x174x45mm, 476g	32.5x243x160mm, 508g	160x83x220mm, 640g	243x161x33mm, 1.1kg
Warranty	1 year	5 year	3 years	2 years	1 year
FULL REVIEW	TINYURL.COM/MFDLLSC	TINYURL.COM/MUAFBHP	TINYURL.COM/KKJMPCE	TINYURL.COM/K4ZATKV	TINYURL.COM/MUXCBNM

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NAS drives	1	2	3	4	5
	Synology DS413j	Qnap TS-421	Synology DS1813+	Asustor AS-604T	Zyxel NSA325
Price	£250 inc VAT (diskless)	£382 inc VAT (diskless)	£775 inc VAT (diskless)	£430 inc VAT (diskless)	£95 inc VAT
Website	Synology.com	Qnap.com	Synology.com	Asustor.com	Zyxel.co.uk
Launch date	Oct 13	Mar 14	Jan 14	May 14	Jun 12
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Drive bays	4	4	8	4	2
Processor	1.6GHz Marvell mv6282	2GHz Marvell single-core ARM	2.13GHz Intel Atom D2700 dc	2.13GHz Intel Atom	1.6GHz processor
Memory	512MB DDR3	1GB DDR3	2GB DDR3	1GB DDR3	512MB DDR2
Remote access	✓	✓	✓	✓	✓
eSATA	✗	✓	✓	✓	✗
USB port	2x USB 2.0	2x USB 3.0, 2x USB 2.0	2x USB 3.0, 4x USB 2.0	2x USB 3.0, 4x USB 2.0	2x USB 2.0
Raid options	0/1/5/6/10/JBOD	0/1/5/6/10/JBOD	0/1/5/6/10/JBOD	0/1/5/6/10/JBOD	0/1/JBOD
Software	DSM 4.1	Backup Station	DSM 4.3	Asustor utilities, App Central	zPilot
Dimensions	184x168x230mm	177x180x235mm	175x340x233mm	230x170x185mm	108x205x147mm
Weight	2kg	3kg	5.2kg	3.5kg	1.8kg
Warranty	2 years	2 years	3 years	2 years	1 year
FULL REVIEW	TINYURL.COM/PL8XM8S	TINYURL.COM/MCYWUB8	TINYURL.COM/PWO4M6J	TINYURL.COM/NX5QO8M	TINYURL.COM/7B9EPW8





USB drives	1	2	3	4	5
	G-Technology Professional	LaCie Little Big Disk	G-Technology Thunderbolt	Toshiba Stor.E Basics	LaCie Fuel
Price	£250 inc VAT	£770 inc VAT	£599 inc VAT	£92 inc VAT	£170 inc VAT
Website	G-technology.com	Lacie.com/uk	G-technology.com	Toshiba.co.uk	Lacie.com/uk
Launch date	Sep 13	Feb 14	Aug 12	Nov 13	May 14
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Capacity tested	4TB	1TB	8TB	2TB	3.5
Capacity range	2TB to 4TB	512GB to 2TB	4TB to 8TB	320GB to 2TB	1TB
Disk size	3.5in	2.5in	3.5in	2.5in	2.5in
Spin speed	7200rpm	5400rpm	7200rpm	5400rpm	5400rpm
Transfer speed	N/A	635MB/s	329MB/s	94MB/s (USB 3.0)	94MB/s (USB 3.0)
Encryption	None	None	None	None	Password protection
Other interfaces	FireWire 800	None	None	None	Wi-Fi 802.11b/g/n
Software	None	LaCie Backup Assistant	None	None	LaCie utilities
Dimensions	235x130x46mm	40x140x85mm	235x130x85mm	119x79x21mm	115x115x23mm
Weight	1.35kg	650g	2.3kg	215g	300g
Warranty	3 years	1 year	3 years	1 year	2 years
FULL REVIEW	TINYURL.COM/NV7F32F	TINYURL.COM//KRCL3VZ	TINYURL.COM/CXEF6MH	TINYURL.COM/LBHC8EL	TINYURL.COM/LK3398C






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SSDs					
	1	2	3	4	5
	Crucial M550	OCZ Vector 150	Samsung 840 EVO	Crucial M500	Seagate 600 SSD
Price	£350 inc VAT	£135 inc VAT	£312 inc VAT	£175 inc VAT	£202 inc VAT
Website	Crucial.com/uk	Ocz.com	Samsung.com/uk	Crucial.com/uk	Seagate.com/gb
Launch date	May 14	May 14	Nov 13	Aug 13	May 14
Overall rating	★★★★★	★★★★☆	★★★★★	★★★★★	★★★★☆
Capacity tested	1TB	240GB	750GB	480GB	480GB
Price per GB	35p	56p	42p	36p	43p
Memory cache	1GB LP DDR2	512MB	1GB LPDDR2	512MB DDR3	N/A
Controller	Marvell 88SS9189	Indilinx Barefoot 3 M00	Samsung MEX (3-core ARM)	Marvell 88SS9187	Link A Media Device
Encryption	AES 256-bit	AES 256-bit	AES 256-bit	AES 256-bit	None
Flash	Micron 20nm MLC NAND	Toshiba 19nm MLC	Samsung 19nm Toggle NAND	Micron 20nm MLC NAND	Toshiba 19nm MLC
Firmware updated via	Bootable CD	OCZ Toolbox, bootable	SSD Magician for Windows	ISO boot disc	Seagate Firmware, bootable
ATTO peak sequential	R: 563MB/s; W: 514MB/s	R: 557MB/s; W: 534MB/s	R: 554MB/s; W: 537MB/s	R: 539MB/s; W: 433MB/s	R: 555MB/s; W: 474MB/s
CDM peak IOPS	100 / 91.7	92.9 / 94.7	104K (read)	89.8k (read)	96.8 / 88.6
CDM 4kB rnd	30/99	25/97	N/A	N/A	28/78
Warranty	3 years	5 years or 91TB writes	5 years	3 years	3 years
FULL REVIEW	TINYURL.COM/MSWD98Z	TINYURL.COM/KBED2W6	TINYURL.COM/L5EDQOY	TINYURL.COM/M2NCSMJ	TINYURL.COM/N58RB8G






Projectors					
	1	2	3	4	5
	BenQ W1300	Optoma W316	Optoma ML1500	Optoma HD30	ViewSonic PJD7820HD
Price	£775 inc VAT	£463 inc VAT	£672 inc VAT	£1,098 inc VAT	£540 inc VAT
Website	Benq.co.uk	Optoma.co.uk	Optoma.co.uk	Optoma.co.uk	Viewsoniceurope.com/uk
Launch date	Jun 14	Jul 14	Aug 14	Jun 14	Jun 13
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★★
Projection technology	DLP	DLP	DLP	DLP	DLP
Resolution (pixels)	1920x1080	1280x800	1280x800	1920x1080	1920x1080
Brightness, Contrast	2000, 10,000:1	3400, 15,000:1	1500, 15000:1	1600, 25,000:1	3000, 15000:1
Image size	300in	300in	100in	362in	300in
Supported aspect ratios	16:9 native	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:9, 4:3
Noise levels (dB)	33 (30 eco)	29db	30db	26db	35 (29 eco)
Connections	VGA, 2x HDMI, USB, 3D	VGA, HDMI, Mini-USB, 3D	HDMI, 2x USB-A, SD	2x VGA, 2x HDMI, 3D	VGA, HDMI, CM, USB
Lamp/lamp life	240W/6000 hrs	190W/10000 hrs	LED/20,000 hrs	240W/6000 hrs	Not supplied/5000 hrs
Dimensions	330x257x128mm	315x223x102mm	270x170x48mm	324x234x97mm	268x221x84mm
Weight	3.4kg	2.5kg	1.4kg	3.1kg	2.1kg
Warranty	3 years	2 years	2 years	3 years	3 years
FULL REVIEW	TINYURL.COM/K4FA89Q	TINYURL.COM/OCWTHGW	TINYURL.COM/QBFRYR7	TINYURL.COM/K4FA89Q	TINYURL.COM/D2H04CV






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Sub-£150 graphics cards					
	1	2	3	4	5
	MSI Radeon R9 270	MSI HD 7770	MSI R7 260X OC	EVGA GTX 650	Gigabyte GTX 750 Ti WindForce
Price	£130 inc VAT	£66 inc VAT	£100 inc VAT	£87 inc VAT	£115 inc VAT
Website	Uk.msi.com	Uk.msi.com	Uk.msi.com	Eu.evga.com	Uk.gigabyte.com
Launch date	Jul 14	Sep 12	May 14	May 13	May 14
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Graphics processor	AMD Radeon R9 270	AMD Radeon HD 7770	AMD Radeon R7 260X	nVidia GeForce GTX 650	nVidia GeForce GTX 750 Ti
Installed RAM	2GB GDDR5	1GB GDDR5	2GB GDDR5	1GB GDDR5	2GB GDDR5
Memory interface	256-bit	128-bit	128-bit	128-bit	128-bit
Core clock/Boost	900MHz/975MHz	1GHz/none	1175MHz/none	1202MHz/none	1033MHz/1111MHz
Memory clock/Effective	1.4GHz/5.6GHz	1125MHz/4.5GHz	1625MHz/6.5GHz	1250MHz/5GHz	1.35GHz/5.4GHz
Stream processors	1280	640	896	384	640
Texture units	80	40	56	32	40
Power connectors	1x 6-pin	1x 6-pin	1x 6-pin	1x 6-pin	N/A
DirectX	11.2	11.1	11.1	11	11.2
Digital interface	2x DVI, HDMI, DP	DVI, HDMI, Mini-DP	2x DVI, HDMI, MiniDisplayPort	2x DVI, Mini-HDMI	2x DVI, 2x HDMI
Warranty	3 years	3 years	3 years	3 years	3 years
FULL REVIEW	TINYURL.COM/MCE7353	TINYURL.COM/BWJ7BL9	TINYURL.COM/OZ6WUYT	TINYURL.COM/AKT2XOM	TINYURL.COM/Q7K4ESV

£151+ graphics cards					
	1	2	3	4	5
	Gigabyte GeForce GTX 770 2GB	Gigabyte Radeon R9 280X	MSI Radeon R9 290X Boost	MSI Radeon R9 270X	MSI Radeon R9 295 X2
Price	£240 inc VAT	£225 inc VAT	£325 inc VAT	£155 inc VAT	£1140 inc VAT
Website	Uk.gigabyte.com	Uk.gigabyte.com	Uk.msi.com	Uk.msi.com	Uk.msi.com
Launch date	Aug 13	Mar 14	Apr 14	Dec 13	May 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★☆
Graphics processor	nVidia GeForce GTX 770	AMD Radeon R9 280X	AMD Radeon R9 290X	AMD Radeon R9 270X	AMD Radeon R9 295 X2
Installed RAM	2GB GDDR5	3GB GDDR5	4GB GDDR5	2GB GDDR5	8GB GDDR5
Memory interface	256-bit	384-bit	512-bit	256-bit	2x 512-bit
Core clock/boost	1137MHz/1189MHz	1GHz/1.1GHz	1GHz/1GHz	1030MHz/1120MHz	1018MHz/N/A
Memory clock/Effective	1752MHz/7010MHz	1.5GHz/6GHz	1.25GHz/5GHz	1.4GHz/5.6GHz	1.25GHz/5GHz
Stream processors	1536	2048	2816	1280	2x 2816
Texture units	128	128	176	80	2x 176
Power connectors	1x 6-pin, 1x 8-pin	2x 8-pin	8-pin, 6-pin	2x 6-pin	2x 8-pin
DirectX	11	11	11	11	11
Digital interface	2x DVI, HDMI, DisplayPort	DVI, HDMI, 2x Mini-DisplayPort	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, 4x Mini-DP
Warranty	3 years	3 years	3 years	2 years	3 years
FULL REVIEW	TINYURL.COM/OAG6277	TINYURL.COM/OWVAP37	TINYURL.COM/NPET8ER	TINYURL.COM/OYA2DFJ	TINYURL.COM/POTAOGZ

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Sub-£200 flat-panel displays					
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5 PC ADVISOR RECOMMENDED
	AOC i2369Vm	BenQ GW2760HS	Philips 234E5QHAW	NEC MultiSync E243Wmi	BenQ GL2450
Price	£140 inc VAT	£180 inc VAT	£140 inc VAT	£185 inc VAT	£108 inc VAT
Website	Aoc-europe.com/en	Benq.co.uk	Philips.co.uk	Nec-display-solutions.com	Benq.co.uk
Launch date	Jul 14	Dec 13	Jul 14	Jun 14	Jul 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Screen size	23in	27in	23in	23.8in	24in
Panel type	IPS matt	A-MCA	IPS matt	IPS matt	TN matt
Native resolution	1920x1080 pixels	1920x1080 (82ppi)	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel density	96ppi	82ppi	96ppi	93ppi	92ppi
Brightness	220cd/m ²	300cd/m ²	187cd/m ²	250cd/m ²	261cd/m ²
Static contrast ratio	630:1	950:1	210:1	650:1	610:1
Response time	6ms	4ms	5ms	6ms	5ms
Ports	HDMI, HDMI/MHL, DP, VGA	HDMI, DVI, VGA	2x HDMI (QHAB) or 1x HDMI (QDAB), VGA	DP, DVI-D, VGA	DVI-D, VGA
Dimensions	531x204x398mm	472x191x623mm	532x213x414mm	558x214x380-490mm	579x179x436mm
Weight	3.75kg	4.5kg	3.5kg	6.3kg	4.1kg
Warranty	3 years	2 years	2 years	3 years	2 years
FULL REVIEW	TINYURL.COM/OOEFYPR	TINYURL.COM/NF3WVFY	TINYURL.COM/KLYLW4V	TINYURL.COM/KNCGVOU	TINYURL.COM/OOUPFUE

£201+ flat-panel displays					
	1 PC ADVISOR RECOMMENDED	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5 PC ADVISOR RECOMMENDED
	BenQ BL2411	Asus ProArt PA279Q	AOC Q2963PM	Dell UltraSharp 32 Ultra	ViewSonic VP2772
Price	£227 inc VAT	£670 inc VAT	£312 inc VAT	£1,600 inc VAT	£558 inc VAT
Website	Benq.co.uk	Asus.com/uk	Aoc-europe.com/en	Dell.co.uk	Viewsoniceurope.com/uk
Launch date	Apr 14	Jul 14	Mar 14	Jun 14	Jun 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Screen size	24in	27in	29in	31.5in	27in
Panel type	IPS	IPS matt	AH-IPS	IGZO	AH-IPS
Native resolution	1920x1200 (94ppi)	2560x1440	2560x1080 (96ppi)	3840x2160 pixels	2560x1440 pixels
Pixel density	94ppi	108ppi	96ppi	140ppi	109ppi
Brightness	300cd/m ²	350cd/m ²	240cd/m ²	350cd/m ²	350cd/m ²
Static contrast ratio	650:1	640:1	530:1	550:1	560:1
Response time	5ms	6ms	5ms	8ms	6ms
Ports	DVI, DP, VGA	DVI, HDMI, 2x DP, 6x USB 3.0	HDMI, DVI, DP, VGA	HDMI, DP, Mini-DP, 4x USB 3.0	HDMI, DVI, Mini-DP, 4x USB 3.0
Dimensions	366x555x236mm	641x560x240mm	714x214x388mm	750x214x483-572mm	643x348x470mm
Weight	6.7kg	10kg	6.9kg	9.2kg	8.5kg
Warranty	3 years	3 years	3 years	3 years	3 years
FULL REVIEW	TINYURL.COM/PMV5L5V	TINYURL.COM/NR8RDQ6	TINYURL.COM/NXDAGMK	TINYURL.COM/O4CTO3S	TINYURL.COM/LLQRWTX

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MARTYN
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Have your mind blown

Life was simple once. In a bygone age, each day was a trudging affair of toil in the fields, battling against ever changeable elements with merely a leather jerkin and Cornish pasty for comfort. All of this was done in the knowledge that when your exhausted frame hit a rather hard bed, tomorrow would arrive with the same burdens to fulfil once more. But on the horizon there was always hope, a day to look forward to that made the relentless labour endurable. A sunny morning that heralded a cessation to the exactions, and instead brought forth celebration – the end of the harvest. Then brightly coloured ribbons would be tethered to the maypole, and young folk would gaily dance in jubilation, while older residents bedecked themselves with jangly items and performed the ancient art of gentle country stick fighting, singing strange incantations are trying not to spill their scrumpy. All was good in the world, and for a few shining hours life was the best it could be. Then the internet arrived and ruined everything.

Scarcity is a good thing. There are notable exceptions, of course – food and oxygen leap to mind – but in general it's not always advantageous to the human spirit when we have an overabundance of anything. Times of sheer joy need to be contrasted with the mundanity of normal life. Transversely, we don't want to find ourselves in the depths of despair for more than the most fleeting of moments.

In order for all this to work, and our minds be able to cope with life, there needs to be a norm. Social media has done its best to provide such a mediocrity benchmark by vehemently broadcasting the most banal aspects of people's lives. For a while there was a propensity towards pictures of food that friends were about to eat; selfies have become so widespread that even world leaders are getting in on the act, and vaguebooking is a new way of spreading malaise to a disinterested audience. Our safety net was securely intact. Yet a new danger has emerged, a threat to sanity so severe it causes technology journalists to overstate its potential impact in verbose fashion. A burgeoning terror of happiness in our feeds – Upworthy, Buzzfeed and the age of extreme amazement.

Here's a typical headline from these sites that appeared in my Facebook feed recently: "Watch This Fearless Cat Save A Boy From A Vicious Dog Attack." Now, in isolation such stories are pretty cool. I even watched the cat video about six or seven times. The problem is that the cumulative effect of several stories a day, often reposted innumerable times, is slowly warping my

expectations of life. I think I would be crushed now if I approached a street busker, only to discover that he wasn't a world-renowned violinist. I knew where I was with Instagram, when a cup of coffee and a bun was the most exciting thing presented that day. Now I have to contend with a flood of incredible moments that expose the wondrous heart of people in increasingly spectacular ways.

Of course, I've the option of restricting my feed, although that will hold only for about three seconds before Facebook, in all its benevolent glory, magically resets every preference. But really this is no solution. How can I return to ploughing the word fields when maypoles are being erected constantly in all the neighbouring villages? And it isn't just cats battling dogs that are the problem, there's the other side of the coin – extreme outrage.

There's a simple adage that sums up how much of a social tinderbox the internet really is: how do you start an argument online? 1) State your opinion. 2) Wait.

Following the comment threads of any even vaguely controversial subject can be a terrifying ordeal. Threats fly freely, characters are called in to question, and grammar is ritually slaughtered with callous abandon. It's like being transported back to a feudal version of life where your opinion must triumph at all costs, lest your tribe be overrun and lineage destroyed. It can be quite a mind-bender when the two worlds collide. Watching a video about some incredible, awesome, tear-inducing moment of beauty, then scrolling down into the depths of hell below can do strange things to the soul. Within a screen's length, you are presented with the best and worst (at least in a typed sense) of your fellow species, plus several posts with links for earning good money working at home.

The real worry is that all of this will continue to escalate. How long before pigeons are fending off crocodiles to save babies that are dangling off the end of meteorites? Anything less just won't stimulate my empathy glands. It can also only be a matter of time before a discussion on the merits of digestive biscuits devolves into one commenter emailing a fission bomb to the 3D printer of a rival who dared to suggest that Ginger Nuts were better for dunking in tea. Which they plainly are dammit! The old Chinese curse "may you live in interesting times" never seemed more prescient. ☒

“ I think I would be crushed now if I approached a street busker, only to discover that he wasn't a world-renowned violinist ”





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: NVIDIA GTX760 OC 2048MB GDDR5
: 8GB DDR3 1600MHz
: 2TB HDD / 8GB SSD HYBRID HARD DRIVE

FROM £749.99



HELLION 1300 GAMING PC

: INTEL i7-4790K 4.60GHz O.C. Quad Core
: NVIDIA GTX780 3072MB GDDR5
: 8GB DDR3 1866MHz
: 2TB HARD DRIVE + 250GB SSD
: WINDOWS 8.1 (64Bit)

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4K
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Reveal every detail with Ultra HD

Get superior performance from every inch of your screen! With four times the resolution of Full HD, 1ms response times and 60 Hz refresh rates, this 28-inch 4K Ultra HD monitor is in a class of its own. The speed and clarity make it perfect for industries like gaming, while the 1.07 billion colors will impress creative professionals. Picture-in-picture and picture-by-picture mode boost productivity and the 3-watt speakers offer richer sound. Connect devices with DisplayPort and USB 3.0, plus MHL over HDMI to mirror mobile content. At home or at work, this monitor is made for users who demand the best.



Innovative height adjust stand (130mm) and pivot



Without HD



With HD



Picture



PRODUCT DETAILS

- Inputs: D-Sub, DVI-D, HDMI, USB 2x 2.0 and 2x 3.0, DisplayPort
- Upto 1 ms GtG
- 3840 x 2160 @ 60 Hz
- Special Features: PIP (Picture in Picture), PBP (Picture by Picture), -5/24 Tilt, Swivel, Pivot, 130 mm height adjust
- 300 cd/m²

PRO