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IDG UNITED KINGDOM

JIM MARTIN

Preview: Windows 10

Microsoft has listened to users with its latest OS

It's no secret that Windows 8 hasn't been as popular as Microsoft had hoped. In fact, by the end of 2013, it accounted for just two percent of all copies of Windows installed on business systems. Over half were Windows 7, and almost a third XP. For consumers, avoiding Windows 8 has been trickier since it comes preinstalled on laptops and PCs, and requires considerable effort and determination to 'downgrade' to Windows 7 or another operating system.

Announcing Windows 10 at the very end of September, Microsoft issued something of a mea culpa, and promised that there will be no "duality" and unfamiliarity in the next version of Windows. Calling it Windows 10 is almost as confusing as Windows 8's split interface, but Terry Myerson – the head of Microsoft's Operating Systems Group – insisted that the name will make sense when we've all seen "the product in its fullness".

Everything announced at the understated launch – see page 6 for full details – bodes well for Windows' future. The Start menu is back in its old place and there's just one desktop on which all software runs, including windowed modern apps. What's interesting is that Windows 10 will run on everything from your smartphone and tablet to your laptop and desktop PC. It will even run on your Xbox One, and there will be a single store where you can buy apps and games for any of your devices.

Another departure from the norm is that the Technical Preview – a very early build of Windows 10 – is freely available for anyone to install through the new Windows Insider Program (tinyurl.com/mz25362). The aim is to build a large base of testers - both business and PC enthusiasts – and then listen closely to their feedback.

So it's great news all-round. At last, Microsoft has realised that loyal Windows users don't want to be pushed into using a touch-oriented OS on their traditional desktop PC. At the same time, there's an acknowledgement that the same people own smartphones and tablets – and Xboxes – where they do want a different interface and control method.

If you can buy a single app that will run on your smartphone and PC, that's a pretty compelling reason to upgrade to Windows 10. Let's hope that developers get on board with the idea; we'll have to wait until at least the summer of 2015 to find out if it's a success or not. ☒

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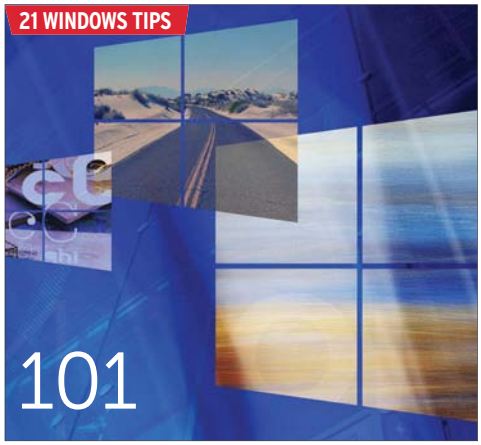

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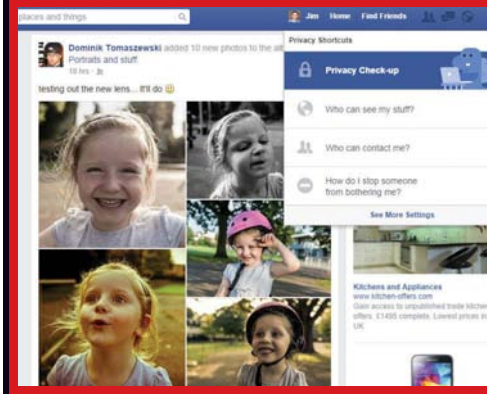

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Windows 10 announced, and you can try it out today

Microsoft invited surprisingly few journalists to an intimate gathering to unveil Windows 10

Rumours had suggested that it wouldn't be called Windows 9, and they were right. It's fair to say that Windows 8 has not been a universal success. In many ways a necessary step not terribly well executed, Windows 8's attempt to stitch together desktop and mobile has been way too radical to encourage new users. And as the longer life of existing PCs and laptops combines with the growth of smartphones and tablets to continually slow PC sales, the operating system has come to be seen as a dud.

This means two things: a new and improved Windows in the fastest possible time and a jump in version numbers to put Windows 10 well away from Windows 8.

As Microsoft's Terry Myerson put it: "We also know that the world today is very different from the one in which Windows grew up. Today, devices outnumber people. Connectivity is like oxygen.

"It's time for a new Windows. This new Windows must be built from the ground-up for a mobile-first, cloud-first world. This new Windows must help our customers be productive in both their digital work and their digital life. This new Windows must empower people and organisations to do great things.

"Windows 10 will run across an incredibly broad set of devices – from the Internet of Things, to servers in enterprise data centres worldwide. Some of these devices have 4in screens – some have 80in screens – and some don't have screens at all. Some of these devices you hold in your hand, others are 10 feet away. Some of these devices you primarily use touch/pen, others mouse/keyboard, others controller/gesture – and some devices can switch between input types. We're not talking about one UI to rule them all – we're talking about one product family, with a tailored experience for each device."

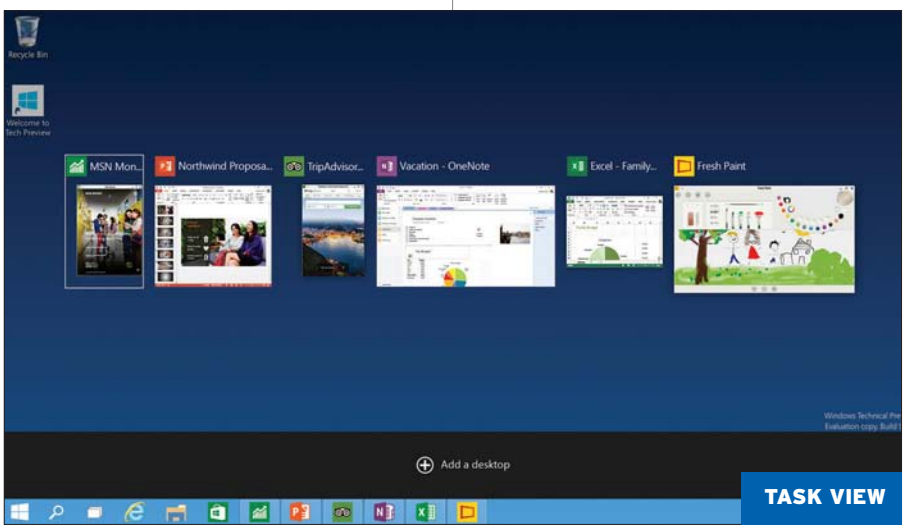
What this means in practice is that the next generation of Windows software – apps – will be universal. In theory, a developer will be able to produce an app which will run on your Windows Phone 10 smartphone, tablet, laptop or PC. While the interface will scale and change depending on the screen size and whether or not it's a touchscreen, it will be the same app underneath.

Microsoft badly needs to keep businesses on side and this is why it has made the Technical Preview available so early. Anyone who wants to can download it from tinyurl.com/mz25362 and try out the new features and interface, which includes the return of the Start menu.

Expanded Start menu: Windows 10 will look and work a lot more like Windows 7 than 8, and it will be a place where traditional and modern apps happily coexist. There are no longer separate desktops. The Start menu is much like a smaller version of the Windows 8 Start screen and you'll be able to resize it.

The operating system will include the same search as you get in Windows 8, so as well as local results you'll see websites and other relevant online information.

Apps that run in a window: Modern apps will run on the desktop in a Window, just as Microsoft had hinted previously. This might sound obvious if there's only one desktop, but it means that there's now no real distinction between traditional Windows software such as Excel or



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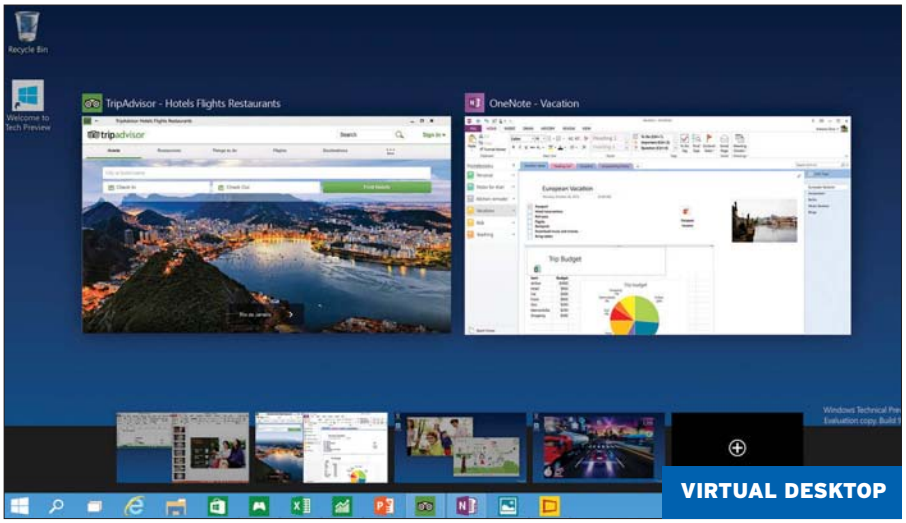


Photoshop and apps from the Windows store. All apps can be resized and moved around the desktop and have title bars so they can be minimised to the task bar.

Snap improvements: The snap function with which you're already familiar in Windows 7 and 8 has been improved and will work with all apps, new and old. A new layout means you can snap up to four apps on the same screen. A new feature called Snap Assist shows other apps and programs running and will suggest how to fill unused screen space with other open apps.

Task View: There's a new button on the taskbar called Task View. Press it and you'll see a thumbnail of all the apps that are open. It's very much like Mac OS X's Expose feature, and that's a good thing. It's Microsoft's way of helping novice users to get familiar and proficient with multitasking.

Multiple desktops: Windows 10 will also support multiple desktops, instead of requiring you to download extra software. These virtual desktops are ideal for keeping more apps open and quickly switching between them, even if you have only one physical monitor.

Improved command prompt: One for the geeks, this, but finally you can copy and paste directories into the command prompt.

Touch mode: The new version of Windows is about making those who were unhappy with Windows 8 happy. The focus is very much about the keyboard and mouse, but those who have devices with touch capabilities haven't been forgotten.

If you're on a device such as a two-in-one hybrid – think Surface tablet – you'll see what looks like a redesigned Windows 8 Start screen. There are all the live tiles you're used to, but you still get the task bar and new Start menu to retain a feeling of unity with the desktop.

Why is it called Windows 10?

During a short Q&A session after the briefing, Myerson made it clear that the next version of Windows Phone – after 8.1 – would be 10 and said, "when you see the product in its fullness I think you'll agree with us that [Windows 10 is] a more appropriate name."

Release date and price

We had anticipated the next version of Windows to launch in April 2015, but it will be "later in the year" in 2015.

No information was given on pricing, but a Microsoft executive in India has said it will be free for Windows 8 users. Myerson stated at the Windows 10 briefing that the finished product is a long way off, but the intention was to make it available for as many devices as possible, suggesting that those with Windows Phone 8 and Surface RT would be able to update to Windows 10 as well as full Windows 8 tablets, plus laptops and PCs.

Samsung announces it's decision to leave the laptop market

South Korean company reveals its decision to stop selling laptops, including its range of Chromebooks

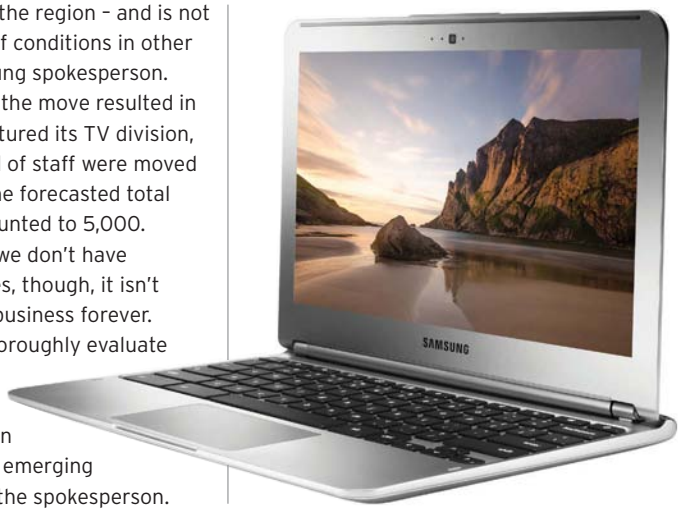
Following in the path of Sony and its Vaio PCs, Samsung has decided to exit the laptop market stopping sales of Ativ Windows and Chromebook devices in Europe. It's common knowledge that the PC market is in decline, with Sony pulling out and selling its Vaio business back in February of this year.

Despite being a giant of the tech world, Samsung has now followed suit. Things have been quiet from the company this year on the laptop side of things, with no new devices on show at IFA 2014 in Berlin. The firm's main recent releases have included the Ativ Book 9 Plus and Ativ Book 9 Lite.

"We quickly adapt to market needs and demands. In Europe, we will be discontinuing sales of laptops including Chromebooks for now. This is specific to the region – and is not necessarily reflective of conditions in other markets," said a Samsung spokesperson.

In the case of Sony, the move resulted in job cuts. It also restructured its TV division, and although a handful of staff were moved to the new company, the forecasted total loss of employees amounted to 5,000.

In Samsung's case, we don't have any details on job losses, though, it isn't necessarily out of the business forever. "We will continue to thoroughly evaluate market conditions and will make further adjustments to maintain our competitiveness in emerging PC categories," added the spokesperson.



iPhone 6 NFC chip may open to developers soon

You may be delighted that the iPhone 6 has NFC, but if you're looking forward to pairing it with speakers and using it for other NFC-related tasks, then think again because its use is restricted to ApplePay. However, at the launch of the Apple Watch, the company gave an example of using the device to enter a hotel room using the NFC chip. The smartwatch is due to launch early next year and this is when Apple might open up access to the NFC feature of the iPhone 6 to other developers.

MORE: tinyurl.com/ppesxxu

Amazon launches Kindle Unlimited service in the UK

After launching in the US a few months ago, Amazon has brought its Kindle Unlimited service to the UK as a sort of Netflix for books. It will cost £7.99 per month. The service offers unlimited access to over 650,000 e-books including the *Harry Potter* and *Hunger Games* series. Users can test it out with a free 30-day trial in the same way as Amazon Prime Instant Video. As well as regular books, subscribers will have access to more than 2,000 audiobooks from Audible. The service is accessible across Kindle devices and free Kindle reading apps for iPhone, iPad, Android tablets and smartphones, Windows Phone, PC, Mac and Windows 8.

MORE: tinyurl.com/mn2bf2f

Microsoft buys Minecraft maker Mojang for $2.5 billion

The rumours turned out to be true. Minecraft to become a Microsoft property

Microsoft has acquired Mojang, the company behind the wildly popular game Minecraft, for a cool $2.5bn. The deal spells the end of independence for one of the most popular indie titles ever as Mojang joins Xbox Studios.

But this is far from the end of Minecraft. With a voracious fan base and 100 million downloads on PCs alone, it's one of the most successful independent titles of all time. Microsoft is so certain of its success that it expects the Mojang investment to break even during its 2015 financial year on a GAAP basis.

For Minecraft fans, this is a scary time, but Mojang's new owner is counting on the game remaining a big draw, and that can only happen if the game remains as widely available as it is now.

Microsoft says it will continue to "make Minecraft available" across all the platforms it is on today, including Android, iOS, PC, Xbox and PlayStation. Hopefully, this means Microsoft plans on active development of the game for competing platforms.

And there's good reason to believe this is the case. Microsoft CEO Satya Nadella's focus for the company is on cross-platform services, and you

can't get much more cross-platform than a widely available game such as Minecraft.

In fact, the only place it's lacking in its cross-platform credentials is the new Microsoft universe, specifically Windows Phone and the Windows 8.1 modern UI. It's a safe bet we'll soon see versions of Minecraft for both platforms.

Microsoft expects the Mojang acquisition to receive regulatory approval before the end of 2014.

4oD to become All 4 digital service next year: Will show TV from the future

Channel 4 has confirmed 4oD will become a new service called All 4 next year

Channel 4 has announced that the popular 4oD catch-up and on-demand service will become 'All 4' next year. The broadcaster is calling All 4 its new digital home for all Channel 4 content, which in essence what the iPlayer is to BBC. The new brand identity will "present all of Channel 4's linear channels, digital content and services in one place, for the first time", according to David Abraham, chief executive of Channel 4.

"Having been a pioneer of VoD services in the UK, we think the future of TV viewing lies not with either linear or on-demand, but a creative and visual integration of the two worlds, blending the strengths of both into a single brand."

4oD will be replaced by All 4 by the end of March 2015, offering content from the past, present and future: On Demand, Now and On Soon respectively. The most interesting of these is On Soon, which will showcase new clips and promos of upcoming shows.

All 4 will launch first on PC and iOS devices with more platforms added over the course of the

year. Registered viewers will get an increasingly personalised experience with a 'bespoke set of content and related experiences for viewers'.

"We believe All 4 will deliver the most advanced broadcaster response to changing viewer behaviour in the digital age, and will help ensure that our content portfolio remains an important, valued part of viewers' TV consumption for decades to come," added Abraham.

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SIMON JARY

Why I won't buy an Apple Watch

Simon Jary looks at the pros and cons of getting an Apple Watch

I've been a sucker for most new Apple products: queuing up for the original iPhone, and a few years after that getting the first iPad on launch day, actually being the first non-Apple or Apple PR person in the UK to hold an iPod, splashing £1,500 on a Mac LC and a Personal LaserWriter LS straight out of university...

I've purchased too many different types of iPod, and once bought an official pack of Apple playing cards from the Apple HQ campus store. I have an Apple TV sat in a drawer somewhere. Hell, I even owned a Mac clone. So I'm an obvious target for the Apple Watch. Except, I'm not that bothered. And I really should be.

I'm an active user of a Fitbit Force activity tracker, so I'm game for wrist-bound health gadgets. I've worn a watch since I was about seven. Try watching the Apple Watch videos. If you like watches, it's hard not to be impressed. Let's be honest, it's hard not to drool.

Not everyone owns a watch, or has any wish to. Mintel's 2010 study figures show that 14 percent of the UK population don't want to wear a watch, which translates to around nine million people. Many of the remaining 86 percent might not be wearing it every day; they only claim to 'own' a watch. This is reportedly down to the mass adoption of smartphones. So blame Apple. Even dumb phones tell you the time.

Again, I'm not sold on using my phone as a timepiece, so an Apple Watch should suit me fine. I like to merely turn my wrist to see what time it is, not pull the damn phone out of my pocket. It's also less obvious in meetings, when stuck in conversation with someone you'd rather avoid, or while chatting to your partner.

Geek appeal

There's no doubt that the Apple Watch looks cool, and stylish, and has tremendous geek appeal. And everyone's a geek nowadays, right? People are saying that they thought the iPad was silly until they bought one. That's a good point. You find out how good something is by using it, and the iPad has been a massive hit. That said, I love the iPad as a device but hardly ever touch mine, except to pull it from my daughter's grasp when she's been on it too long. I could easily live without my iPad. And something tells me the same would be true of the Apple Watch.

The Apple Watch comes in three models and plenty of flavours – 34 in total by our counting. The entry-level option will be priced starting at $349, so expect a £299 price tag in the UK. The Apple Watch Sports version will likely cost more, and the high-end will be a choker.

I wear two watches. My Fitbit Force, which includes a time display, is on 24 hours a day as it measures my sleep, as well as letting me know when to drag myself out of bed and start walking and climbing to my distance targets.

My other watch is both more traditional and a lot more personal. It's a 1967 Rolex Oyster Perpetual that was my grandfather's retirement present. As such it has sentimental value, plus a stylish factor.

And, unlike the Apple Watch, it never runs out of juice. I don't even have to wind it up, as its self-winding mechanism handles all that for me. The Fitbit needs charging every 10 days. Apple hasn't said how often its Watch will need charging, and it will depend on how you use it, but I bet it's more often than once a week once it's properly available. Sources close to Apple reportedly admit that currently it needs charging every day. Use it to its fullest and the prospect of having to charge the thing once a day (Apple's record on battery life is pretty poor, remember)

> **"When Apple launched the iPod, it only worked with Macs, but the Mac was in danger then. Is Apple suggesting it needs the Watch to prop up the market-shedding iPhone?"**

is a big turn off – no matter how cool its inductive charging is.

That Rolex isn't going to sit in a drawer, so the Apple Watch will have to displace my Fitbit, and that means an end to the sleep tracking. I'm a big Fitbit fan, but the Apple Watch's fitness functions look good enough to sway me – especially if the next-generation Fitbit (we think a Fitbit Surge will be out in the next couple of months) fails on some level. The Force was sadly recalled when some wearers suffered an allergic reaction. My wife and I kept ours, as like most owners we didn't get the nickel rash. Fitbit will have worked out such problems, we hope, with its successor. And the Fitbits are compatible with both iPhones and Androids.

The Apple Watch will be an immediate success, I'm sure. There are enough Apple nuts out there with sufficient funds to ensure this. But will the take-up drop off when the rest of the population has to decide whether an Apple Watch is worth it?

The iPhone spread in popularity as people ooh'd and cooed with the phones of early adopters. Word spread quickly, and the iPhone took over the world.

But the rest of the population won't be able to use the Apple Watch, as so many of them now use Android smartphones, and the Apple Watch requires you to own an iPhone. The target market therefore gets so much smaller. Not so small that the Apple Watch is doomed, and not even niche, but smaller for sure. And a recent poll suggests that people won't change their smartphone platform just to use a smartwatch.

When Apple launched the iPod it worked only with Macs, but the Mac was in danger then. Is Apple suggesting it needs the Watch to prop up the market-shedding iPhone?

The next generation of activity trackers will have most of the fitness features of the Apple Watch, and offer more – such as the aforementioned sleep monitoring. And they will be priced at around £100 at the high end. So I'm not sure Apple will make all those users switch to its £300 (minimum) watch, even if it is a thing of beauty with many more uses.

Some of the Apple Watch functions are seriously cool. The Friends tapping messages and images to pals and loved ones is something so new and so wow that only Apple could have come up with it. It has almost limitless possibilities.

There are more than TWO MILLION different watch faces for you to choose from

Maps on your wrist looks handy, too, although the lack of GPS on the Apple Watch limits its use somewhat.

Calendar alerts. Tick. Messages. Tick. Siri? Er, no thanks.

No web browser looks like a weird omission, and photos are going to be too small, surely, and eat up all the probably minimal storage anyway. Ditto music.

So the Apple Watch has to appeal enough to watch users to make them dump their Swatches, Tag Hauers, Tissots, Timexes and multiple fashion-brand watches. High-end Swiss brands are so expensive because they hold their value. Apple is going to find it difficult to break open that market because the Watch has a relatively short lifespan. You don't replace a Rolex every year. You will with an Apple Watch, especially as its battery will reduce in function over time.

That leaves people who don't wear watches. If the Apple Watch can't persuade them that their iPhone won't do instead, then the Apple Watch market gets smaller still.

I love the look of the Apple Watch, and am sucker enough to pony up the dosh on something I don't need. But I love my Fitbit and normal watch just a little too much to consider wearing three watches. Will the Apple Watch be a success? Only time will tell. Well, time and that cool tapping function.

MATT EGAN

The death of the OS as a product

The days of a new version of Windows capturing the popular imagination are long gone

We look back on Windows XP with misty eyes now, but it's worth remembering the excitement that was generated by the prelaunch publicity for Windows Vista. That Vista was such a lemon shouldn't obscure the fact that within PC-loving circles, it was anticipated with something approaching fever pitch. Certainly more interest than the imminent launch of Windows 9 can hope to garner. Windows launches used to be very different in the premobile world.

The high-point of OS-launch excitement was, of course, Windows 95. A $300 million ad campaign featuring The Rolling Stones and the cast of *Friends* combined to create sufficient hype that PC World stores opened at midnight and people actually turned up to buy the latest Windows operating system. It's unthinkable now that national news broadcasts would be led by a Windows launch. That is the exclusive domain of Apple's latest smartphones. And the muted response we can expect to see when Windows 9 launches should be a word of warning to Apple: the iPhone was once a runaway market leader and as such it retains the interest of the wider world. But nothing lasts for ever.

Windows 95 represented a significant staging post in the development of desktop computing as we know it now. It was the first truly graphical user interface for a mass market operating system. And to a greater or lesser extent every version of Windows since has been little more than an iterative upgrade. Indeed, the primary reason for renaming Windows every couple of years is to kickstart the PC upgrade cycle and sell lots of computers. This seems positively quaint in an age of smartphones and tablets – and laptops and PCs that last for years. But as smartphones and tablets have muscled in on laptop territory, and PCs have got cheaper, the urge to upgrade every couple of years has disappeared.

XP is remembered fondly because it was stable and secure, fixing the problems of Windows versions past, and with none of the bugs that spoilt Vista. But at the time it was just okay. It came along when Microsoft was focused on solving problems and improving security rather than adding on features to attract new users. And it also came along at the height of Windows' and desktop computing's popularity. Never again would a Windows OS upgrade have such an effect on the market for PCs and laptops.

Fast forward to 2014 and Windows 9 shares with XP (and Windows 7) the distinction of replacing an unloved version of Windows, ironing out problems and restoring Windows' reputation. As such, it is both a challenge and an opportunity for Microsoft. But it is nothing like the opportunity that was Windows XP. Customers have many more connected computers in their lives these days, and they just don't care as much as they used to. For the most part, the internet is our unifying platform, to which Windows is just another background along with Android, iOS and the rest. Indeed, I'd argue that for many people the Xbox interface is a more important GUI than is their Windows 8 PC.

Windows 8 is disliked because it is a radical if necessary departure from the norm. And because it looks so strikingly different to its predecessors. But it is perfectly fit for purpose, if a little clunky at times. Windows 9 will iron out these kinks and move us further toward a unified mobile and desktop Windows world. Some people will like it, many will profess to hate it, most will notice only when they decide to buy a laptop. Because as important as is the launch of a new Windows, it will never again capture the imagination of the world.

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CHRIS MARTIN

The Galaxy Alpha makes no sense

While Samsung has plumped for a metal case to give the Alpha a high-end look, its specs are a letdown

I've been banging on about poor plastic build quality in Samsung reviews for years now and the company has finally launched a device which, in its own words, has "real metal". That device is the Galaxy Alpha (see above) and while it's great to see the tech giant taking action, the new smartphone is something of an odd ball which doesn't make sense.

The smartphone market is generally split into three categories: budget, mid-range and high-end. They are possibly known as other things, particularly at the expensive end, such as premium or top-end. It's normally pretty easy to place a new smartphone into one of those pigeon holes, but the Galaxy Alpha fits two in different ways.

The easiest way to do it is by price, and going by this measure, the Galaxy Alpha is a high-end smartphone at around £500. Yes, it has that metal design that we've all been waiting for, but at this price, it's more than the Galaxy S5 which, as you probably know, is Samsung's flagship smartphone.

We're used to the company pumping out devices in all shapes, sizes, colours, prices and specs, but with this handset it's competing against itself. It only makes sense for vendors to have one top-end device, hence the term 'flagship'.

The higher price is partly because the cost of the Galaxy S5 has dropped, but also since Samsung needs to take this into account when launching a new smartphone.

You might think that paying more money means you'll get everything that the Galaxy S5 offers, but with a more premium design and build quality. This would have made sense – a Galaxy S5 Prime type branding – but it simply (and strangely) isn't the case. For whatever reasons, the Galaxy Alpha is both better and worse than its sibling.

Of course, the metal on offer is a nice lure (I like shiny things as much as the next man) – although it's worth pointing out that it's limited to the edge like the Lumia 930, so the rear cover is still plastic. But there are a couple of advantages of the Alpha over the GS5. It has a better processor in the form of a Exynos 5 octa-core chip and double the amount of standard storage at 32GB.

Unfortunately, that's where Samsung stopped and decided to downgrade everything else. For example, the Galaxy Alpha has a 4.7in screen with a 720p resolution – a resolution that's common on smartphones as cheap as £100, such as the Moto G. It retains the Galaxy S5's fingerprint scanner and heart rate monitor but so does the Galaxy S5 mini so that's no big deal.

What's strange is the choice to drop the microSD card slot (something which Samsung usually offers without fail) and the IR blaster. Furthermore, it's not IP67 dust and waterproof rated like the Galaxy S5, so that's another downgrade.

Last but not least are a lower capacity battery (not so bad considering the lower screen res) and a camera downgraded from 16- to 12Mp with the loss of features such as phase detection autofocus and dual-tone LED flash.

Don't get me wrong, it's great to see Samsung using some 'real' metal on a smartphone, but with its higher price tag and largely downgraded specifications, the Galaxy Alpha makes no sense and competes against the firm's existing flagship handset.

Perhaps I've got it all wrong and the Galaxy Alpha is in fact an iPhone 6 rival, as many are pegging it, (4.7in screen, metal design and September launch) but if this is the real reason for the device, then Samsung is going down big time.

Hackers expand their horizons

It's not just PCs that are being targeted by hackers. NAS drives are in their sights, too

It's amazing what you can do with a NAS drive these days. Far more than simple file storage and serving, they have evolved into fully fledged computing control centres, taking on many of the tasks of the traditional PC that used to reside in every home.

First it was media streaming, integrating server software especially designed to let you listen to music and watch films with the assistance of on-board DLNA, UPnP or iTunes servers. With these services enabled, you can watch films stored on your NAS with a set-top box adaptor such as the WD TV Live, or play music on a network hi-fi music player from the likes of Cyrus, Linn or Naim.

Then download software was included in the typical NAS feature list, turning a NAS drive into a torrent client to trickle in assorted online content to these always-on PC storage stations.

With the growth of affordable security cameras, many businesses now have an array of IP cameras to monitor their staff, car parks, customers and stock around the clock. And even home users can install IP cams to monitor the car, children or the cat. The NAS drive comes to the rescue here once again, always on and ready to record a steady video stream or simply when motion activated.

More recently, we've seen home NAS drives take on the role of a personal cloud, promoted heavily by WD in its My Cloud hardware range, but available before that as installable apps for Synology and QNAP boxes, too.

With a NAS cloud folder set up and running, you get all the benefits of having synced directories between your Windows PC and Mac, with any change in files on one machine quickly echoed on every other connected PC; and again, the NAS drive is running this show with its central repository of your essential files and folders.

Compared to the usual suspects of Dropbox, Google Drive et al, the result is more secure against government dragnet surveillance and you get the option of terabytes of space for free, rather than gigabytes for tens or hundreds of pounds.

More recently, we've seen a development to let you run a complete PC, on your NAS, virtualised. In the IDG test lab right now, I have a QNAP TS-670 Pro which, when loaded with a large dollop of RAM, promises to run any x86 operating system such as Linux, Unix or Windows. This is taking the lead from big-iron enterprise servers that can virtualise assorted software servers on a single powerhouse server, a move that cuts hardware and energy costs for businesses.

For the home consumer, the use case may be less obvious; maybe you have a Mac-only home but need to run some obscure XP program occasionally. With QNAP's new feature, you needn't go to the expense of purchasing VMware Fusion or Parallels – just load up a sandboxed Windows VM, hosted and run from your NAS.

With all this power comes even greater responsibility – a commitment from the NAS maker to ensure that only you and your family or trusted work colleagues get ease of access to all that precious data.

Unfortunately that's been far from the case recently. Like many internet-attached products, most NAS operating systems have been afflicted by the notorious Heartbleed bug in OpenSSL, which allows unauthenticated remote users the kind of root access that gives your NAS, and all its files, over to a remote attacker. Five months after the public disclosure of this security nightmare, holes are still being shored up – only last week in late September as I write, QNAP was still plugging OpenSSL CVE holes. And in an added insult to users, QNAP's auto-notification system that should alert the NAS admin user that patches have been made available, failed to work. That's a dangerous way to leave your customers with a false sense of security that they're on the latest and most secure build when they log in.

But perhaps the scariest development in NAS insecurity to date was the SynoLocker malware infection. This came to light in August this year, where a flaw in Synology's DSM software allowed online criminals to gain entry and encrypt the contents of the entire NAS drive, extorting money from the owner to unlock the drive and return all its files.

Synology announced that the security hole affected v4.3 and earlier versions of DSM, and was patched in December last year. The current DSM 5.0 is said not to be afflicted. But that's cold comfort for users who don't religiously update their NAS with every new build that's made available.

These kind of critical problems are made worse by the newfound abilities of NAS drives, which now routinely want to open ports in your router and firewall in order to facilitate remote access. One possible remedy is to keep your NAS drives away from public internet-facing services, in anticipation of the next security flaw that could needlessly expose your NAS and all its contents to remote hackers. Logging in to your drive's admin interface to check for new flagged updates ought to be a good idea, although as we found, you can't trust this built-in update service to work, so you'd need to manually check on the maker's website too to double-check for patches.

It's amazing what you can do with a NAS these days, and equally what ne'er-do-wells will think of to exploit them. The most ingenious use of a NAS drive we know of so far? How about breaking in and installing Bitcoin-mining software. A strategy that abused the multi-core processing power now commonplace in many NAS drives, a cheeky strategy that earned the remote hacker an estimated $620,000 in crypto currency from his NAS-botnet.

Synology knows its success in developing and selling its products makes it a bigger target these days, and now sets the NAS firmware to automatically update itself without user intervention. Not only has the NAS taken on a PC-like role in the home and workplace, it's now become a Windows-like malware target and has adopted Microsoft's answer to keeping the PC patched. ☒

ANDREW HARRISON

ASHLEIGH ALLSOPP

Top 10 best-selling mobile phones

Samsung, LG, Sony and Apple may rule the mobile market, but this wasn't always the case

A few days ago, the team here at *PC Advisor* were discussing their first mobile phones and some of their favourites from the early days of mobile technology. That got me wondering: what are the best-selling mobiles of all time? What I found was surprising, with Nokia absolutely dominating the best selling mobile phones of all time.

It'll be interesting to see in five years' time how many of the phones listed here will still be in the top 10, and which will be replaced by newer phones. With such a fast-paced market, it's tricky to believe that any modern phone will sell as well as those old favourites, as their shelf-life is significantly shorter than it used to be now that we all want the latest features on our smartphones.

Anyway, without further ado, here are the top 10 best selling mobile phones ever.

1. Nokia 1100

The best-selling mobile phone ever is believed to be the Nokia 1100 (above left). Released in 2003, over 250 million units were sold. That's more than any iPhone model. The success of the Nokia 1100 wasn't down to its features – it didn't have a camera or even a colour display – but it was cheap, durable and did the jobs any mobile phone should.

2. Nokia 1110

The successor to the Nokia 1100, the 1110 (above right), is also thought to have sold around 250 million units. Launched in 2005, it came with three built-in games and the ability to send picture messages.

3. Nokia 3210

Before the Nokia 1100 and 1110 came the hugely popular Nokia 3210, which I personally remember owning and loving; swapping out the case for whatever new craze I was into that week. It was released in 1999, and sold an estimated 160 million units in total.

4. Nokia 1200

Nokia was also behind the next-best selling phone, the 2007 Nokia 1200, which sold an estimated 150 million units.

5. Nokia 5230

The Nokia 5230 sold around 150 million units, too. This one hit the market in 2009, and is the first in our list to sport a colour touchscreen. It also had a 2Mp rear camera.

6. Nokia 6600

Another mobile phone to sell an estimated 150 million units is the Nokia 6600, a strangely round device released in 2003. It was aimed at business users, and was advanced for its time, boasting a camera, music player, video player, Bluetooth and a memory card slot to add more storage.

7. Nokia 2600

Yep, Nokia again, this time with its 2600 from 2004. Around 135 million units were sold, and it was one of the first from Nokia to feature a colour display.

8. Motorola RAZR V3

Finally, we've got a non-Nokia mobile phone to add to the list This one comes from Motorola. Yep, you've guessed it, it's that hugely popular RAZR V3 flip phone that the company launched in 2004, selling 130 million units. It holds the title of the world's most popular clamshell phone.

9. Nokia 1600

After that short departure from Nokia, we're back with the company for the 1600, which is thought to have sold around 130 million units. Launched in 2006, its success was down to its tiny price tag.

10. Nokia 3310

The final mobile phone in our top 10 is from Nokia yet again. The successor to the 3210, the 3310 launched in 2000 and sold approximately 126 million units. ☒

DAVID PRICE
MACWORLD UK

Apple is trying too hard to be cool

At the iPhone 6 launch, Apple became the embarrassing dad of tech companies, says David Price

Apple unveiled its Apple Watch and iPhone 6 series handsets recently; it's possible that you heard. And while the event's primary objectives were achieved – all humans made aware of the existence of the iPhone 6 Plus: check – it's fair to say that as launch parties go, this one had its ups and downs.

At times, and this is going to sound odd coming from a fan of the company's work, there was the faintest whiff of desperation in the air. Is that too strong a word? Maybe we should just say that Apple seems to be trying too hard.

With each passing year, it turns more and more into the white suburban dad of tech companies. It doesn't normally let that hold it back, any more than white suburban dads can be persuaded not to turn up at their son's youth club with Enya blaring from the car speakers. But Silicon Valley's hip young gunslinger of 1976 hasn't been genuinely countercultural for decades. It turned into The Man a long time ago.

(In a lot of quarters, granted, the perception remains that Apple is cool, and it regularly tops polls of the coolest brands. This is a difficult thing to quantify, but I'd say that Apple is more an uncool person's idea of a cool company. Which, given the ratio of uncool to cool people in the world, is an exceptionally lucrative thing to be.)

Like most embarrassing dads – and I speak here as a white suburban dad as embarrassing as any – sometimes Apple tries too hard to show everyone it's still got it. It tries to show the young upstarts that it can still cut a rug to the latest pop sounds. And the first of this autumn's Apple launch events was a case in point.

This year's iPhone refresh was critical; after a couple of years of aggressive and innovative launches from rivals, it was the big opportunity to reassert Apple's post-Jobs pedigree. And I am convinced that the event was a success. The products on display were of a calibre to show that Apple is in rude health: the iPhone 6 series are fantastic handsets, iOS 8 is fantastic, I am excited about the Apple Watch. This is a great time to be an Apple fan. But this makes it all the more frustrating when the company starts trying too hard.

Take the event's musical turn, a little-known outfit called U2. Contrary to what much of the internet declared after discovering Songs of Innocence in their iTunes purchase history, U2 is not the worst band in the world. But goodness me, it is absolutely the worst band to hire if you want to project an image of youthful confidence.

U2's a band almost as old as Apple itself; a collection of middle-aged millionaire tax exiles that started out as punks and ended up playing stadium arenas and being photographed with politicians. And if that's not a seductive symbol of Apple's corporate evolution, I don't know what is.

Take the Apple Watch, which is gorgeous – and not ready. In an unprecedented move for Apple, the watch was unveiled not only months ahead of shipping but without even a firm shipping date; the prototypes weren't even fully functional, and nobody outside Apple knows exactly what the devices will be able to do.

Since Tim Cook tightened up the firm's supply chain, we've grown used to products being shown off and then shipped within days, but this time it seemed like Apple was so desperate to show it could do wearables in an exciting way that it spilled the beans too early.

And the interviews Tim Cook gave shortly after the launches, which – as my colleague Ashleigh Allsopp points out at tinyurl.com/mhar464 – gave the distinct impression of trying eagerly to win over the doubters.

Apple is in great form at the moment, and I haven't the faintest worries about its direction under Tim Cook. But I sense that the good stuff that Android is also doing has got under Apple's skin a little bit.

And so an otherwise triumphant launch event didn't feel like the biggest company in the world reaffirming its dominance. It felt like an also-ran playing catch-up. "Look – we've got phablets too! We've got wearables too! We've got... er... U2? Yep, still got it."

Like U2, mind you, Apple still sells a lot of products, so it's probably not worrying too much. And unlike U2, its products are better than ever before. It's just that, when you've got that, you can really stop trying so hard to be cool. ☒

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Dell tries to create a splash with PC, tablet innovations

Dell's 6mm Venue 8 7000 tablet is highlighting the company's progress in design, reports Agam Shah

In a copycat PC industry, Dell is trying to attract attention with the innovative features and technology firsts that it's bringing to PCs and tablets.

The company is adding hardware and software features that could make an otherwise mundane PC or tablet more attractive to customers. Buyers may have to pay more for the features, but like Apple, Dell hopes to establish a reputation as an innovator and establish a fan base.

The 8in Venue 8 7000 tablet, for example, has drawn attention for its creative design. Unveiled recently at the Intel Developer Forum, it's the world's thinnest tablet at 6mm thick and includes Intel's RealSense 3D depth-sensing camera. The camera can determine the size, distance and contours of objects, which could enhance videoconferencing or make it easier to capture a 3D image for 3D printing.

Historically, the company was not known as a great innovator. It started out in CEO Michael Dell's dorm room 30 years ago and made strides as a maker of low-cost IBM PC clones selling direct to end users. After going public, and various ups and downs over the years, it became a private company once again in 2013. Though Michael Dell and investment partners fought a protracted battle with some big shareholders to take the company private, the dust kicked up by the privatisation fight seems to have settled.

In fact, the privatisation has helped tune out distractions and helped the company focus on improving products, explained Kirk Schell, vice president of the commercial PC product group.

There's a lot of energy in Dell's PC operations, he argued. "The privatisation seems to have focused the company on the purpose and the customer. The amount of time now that we have freed up by being private, we get to spend with... customers and really honing how we improve our company and product line."

Increased competitiveness

Hewlett-Packard, Lenovo and Asustek have been innovative in their own right, but Dell has been pragmatic about balancing the adoption of new technologies with the price of PCs, said Roger Kay, principal analyst at Endpoint Technologies Associates.

"Dell's always wanted to be stylish and had mixed results in that department," Kay explained. "Because they are no longer reporting to Wall Street, they can be more competitive."

The company can now boast some industry firsts, several of which are tied to the Venue 8. For example, it was also the first to bring wireless charging capabilities to tablets with a dock for its device.

In the external display market, Dell was among the first to introduce a 5K screen with the UltraSharp 27 Ultra HD, which can display images at a 5120x2880-pixel resolution and will become available later this year.

Dell is also the only top PC maker with a gaming console – the Alienware Alpha Steam Machine – which will compete against Microsoft's Xbox One and Sony's PlayStation 4. The Steam Machine taps into the growing excitement around PC gaming, and is expected to ship in time for Christmas, with Windows 8.1 as the default operating system. Users in the future will have the option to install the Linux-based SteamOS, which is being developed by Valve, the world's largest independent game distributor.

Another innovation is Dell Cast, a USB adaptor that can mirror images from Android-based Venue tablets on high-definition screens. The thumb drive-size adaptor is thinner than Google's Chromecast, which also mirrors movies and Android screens. But Dell is bringing the technology to Windows as well.

Over the years, Dell laptops have become thinner and lighter, but also

more robust thanks to use of materials such as carbon fiber. Not every product – the XPS 10 tablet with Windows RT, for example – has succeeded, but the company appears to understand the value of diversifying its product line-up.

However, while the technologies and designs may add a wow factor, there's no guarantee of success. "I don't see it as a competitive advantage, I see it as a distinction," Kay enthused.

Meanwhile, Dell is likely to carry on making low-cost PCs, he added. And as long as the low-margin PC business can foot some bills, the company will also continue investing in design and innovation.

As it has changed its philosophy in building PCs over the past few years, emphasising innovation, Dell has learned a lot about product specifications, testing and materials, Schell revealed. He gave the example of Corning's Gorilla Glass screen, which the company has customised to fit on its laptop screens.

"We're investing in architects, human factor engineers, material scientists, software people. You can and should differentiate, and we are," Schell said.

Fast growth

Dell grew at a fast pace in the 1990s, with a business model resting on building PCs to order and shipping them directly to customers. It became the world's top PC maker in 2001, but the quality of its systems suffered after the company reverted to low-cost production methods to keep up with HP and IBM, whose PC division was bought by Lenovo in 2005. Dell eventually lost its top ranking to HP in 2006, and Michael Dell returned to his post as CEO in 2007 after a spell away from the job.

In 2009, Dell caught headlines with its premium Adamo slim laptop, which was considered a competitor to the MacBook Air at the time. The brand was eventually merged into the XPS line. Many innovations followed, such as a wireless charging dock for PCs in 2009 and a WiGig dock in 2013.

Innovation is one way to attract customers, and new software and hardware features are coming to more products. "We have a lot of stuff in the hopper that we're working on," Schell explained.

While he declined to spill the beans about new products, he offered some hints about what Dell is focusing on. "We're working on a number of productivity and security-based things," he added. ☒

Just upping the resolution risks turning 4K into a dud

An increase to at least 60fps and better colour reproduction is equally important, says Mikael Ricknås

Just increasing the resolution to 3840x2160 pixels won't be enough to make consumers replace existing TVs with 4K models. Improvements such as higher framerates and better colour reproduction will be equally important, according to two industry experts. TV manufacturers are going all in with 4K, hoping it will give them the sales boost 3D failed to achieve. But for broadcasters, the upgrade needs to be about more than just resolution.

"Broadcasters know consumers can barely see the difference between HD and 4K if you do nothing more than change the resolution, and this is well based in solid trials methodology. It isn't just a bit of prejudice. The higher numbers are good for marketing, but not much else," explained Paul Grey, director of European research for NPD DisplaySearch.

For the new format to make a difference, improvements other than a higher resolution are needed, including higher framerates, better colour reproduction and a higher dynamic range for brighter whites and deeper blacks, according to Grey.

Henri Caddeo, CTO at Swedish cable operator Com Hem, agreed: "Depending a bit on what you mean with 4K, it can be impressive looking or not at impressive at all," he said. For example, the demos that have wowed him have all used at least 60 frames per second (fps). The 30fps most often seen isn't good enough, he revealed.

Caddeo was one of many in the TV industry that made the trip to the International Broadcasting Convention (IBC)

in Amsterdam recently, where 4K hardware and content was the big trend.

"No one is talking about 3D. It has been buried, so now everyone is talking about 4K instead," he explained.

At IBC, vendors showed a new level of maturity, according to Grey. They are going from hardware and software that was just cobbled together to solutions that are being designed with 4K in mind. Prices have also started to come down, he said.

Chip makers showed products that will go into 4K-compatible set-top boxes. Broadcom, for example, announced that its chipsets will power TiVo's set-top boxes. Demonstrating its 4K capabilities is an important next step in bringing the technology to consumers everywhere, according to TiVo. However, it isn't ready to reveal any launch dates, a spokesperson said via email.

Broadcom is also working with Vodafone in Germany on a set-top box for the operator's IPTV subscribers, which is expected to become available during the first half of next year.

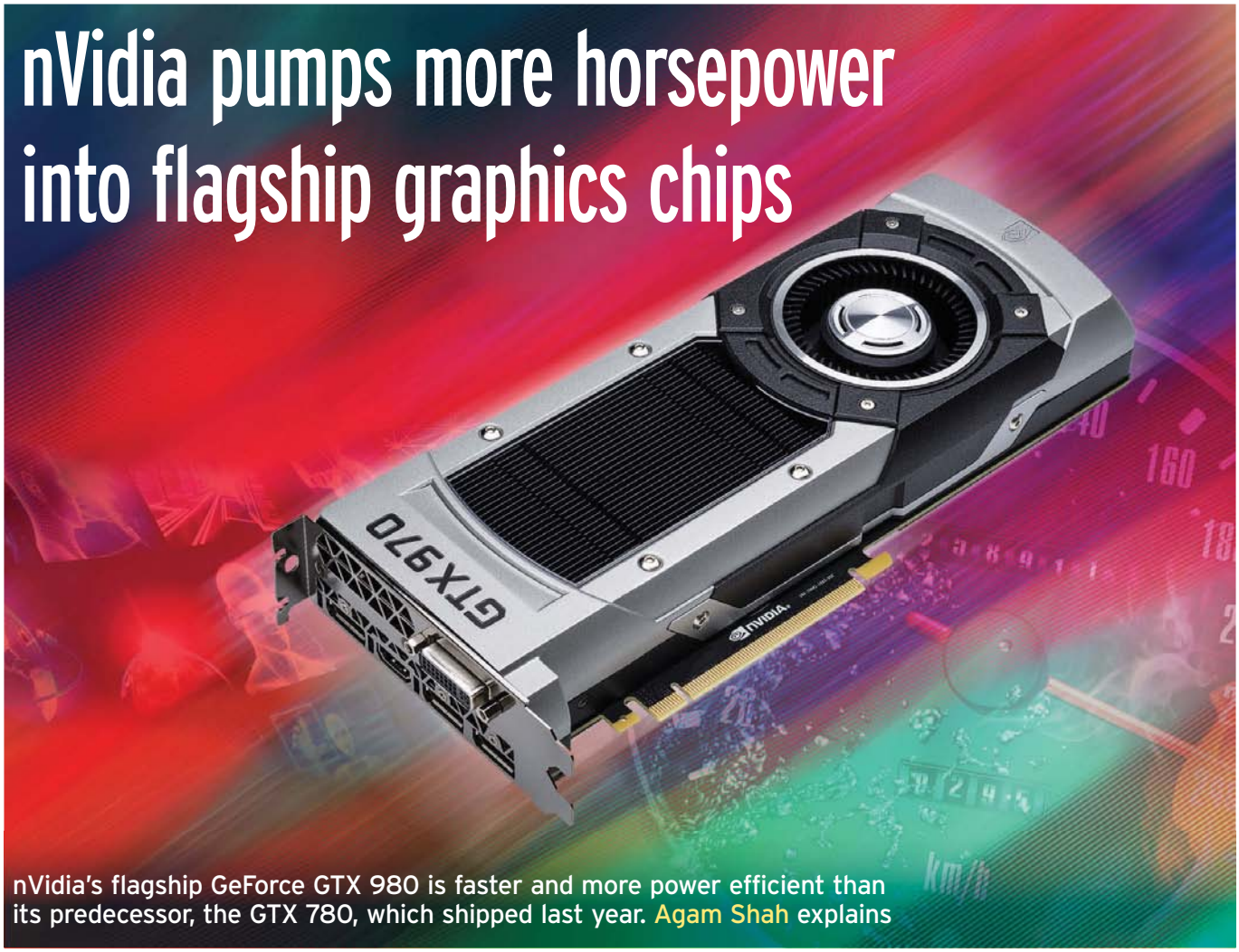
Even if the parts are falling into place for broadcasters and operators to back 4K, the decision to do so isn't an easy one. For example, many have invested in HD equipment and think it would be nice to pay that back before doing it all over again. They also need to come up with effective ways of handling 4K content in a studio setting, which hasn't yet been standardised.

Strategy Analytics expects 4K or Ultra HD TV sales to begin rising this year, but doesn't expect them to become common for some time. It will be 2017 before 10 percent of North American households have a 4K TV, and 2018 before that level is reached in Western Europe.

In the short term, Caddeo is more interested in using HEVC (High Efficiency Video Coding), the video compression standard used in 4K systems, for regular HD broadcasts. It's a key part of making 4K file sizes and bandwidth use manageable, but can also be used to reduce the bandwidth required to stream or broadcast HD programming. Lower bandwidth requirements means room for more channels, and content that's easier for home networks to handle.

Caddeo isn't ruling out introducing 4K at Com Hem, but says the technology's promoters at IBC will all have to pull together if it is to be ready for prime time. To convince TV networks, "The whole chain has to work even under the heaviest loads, on a Sunday night or something like that," he said. ☒

nVidia pumps more horsepower into flagship graphics chips



nVidia's flagship GeForce GTX 980 is faster and more power efficient than its predecessor, the GTX 780, which shipped last year. Agam Shah explains

Chipmaker nVidia is bringing brighter images and sharper special effects to its new flagship GeForce GTX 980 and 970 graphics processing units.

They are the company's fastest GeForce desktop GPUs and are targeted at high-end gamers involved in 4K gaming. It also hopes to boost virtual-reality gaming on headsets through the products.

The GTX GPUs are based on the second-generation Maxwell microarchitecture, and combine hardware and software improvements for better gaming, explained Scott Herkelman, general manager of the GeForce business unit at nVidia.

The GTX 980 can deliver 5 teraflops of performance while drawing 165W of power, compared to its predecessor, the GTX 780, which delivers 4 teraflops of performance while drawing 250W of power. The 980 has 2,048 processing cores and a maximum clock speed of 1.2GHz.

The GTX 970 tops out at 4 teraflops, while drawing 145W of power. It has 1,664 cores and a maximum clock speed of 1.17GHz.

The GPUs have 4GB of GDDR5 memory and are also the first to support the emerging HDMI 2.0 standard, which supports 4K video. They also have hardware encoding and decoding for 4K video based on the H.265 (HEVC) format. Herkelman couldn't reveal whether the GPUs had hardware acceleration to decode 4K video based on Google's VP9 format.

Besides faster horsepower, on-chip features help improve the image quality of low-end games, he said. The GPUs can deliver 4K-quality images to 1080p screens by filtering and improving the quality of pixels. The upscaling, enabled by a feature called Dynamic Super Resolution, is accelerated by the hardware and reduces the processing load on CPUs. It's automatically enabled and can be shut off through the GeForce Experience software.

Another new chip feature is Voxel Global Illumination, which allows lights to bounce off surfaces. For example, the GPUs will be able to dynamically replicate how a sun's lighting reflects off stars or how light from a bulb reflects off a wall and other surfaces in a room. "We can do lighting dynamically for the first time ever," Herkelman said.

Virtual lighting in games can be taxing on processors, but the new GeForce GPUs have features to reduce the processing load, Herkelman said. Voxel will also make it easier for game designers to define a path of light when writing a game.

The GPUs also speed up multimedia tasks such as video editing. The graphics processors support nVidia's CUDA, a set of parallel programming tools that can harness the joint computing power of CPUs and GPUs. Browsers already offer the ability to off-load Adobe Flash video processing to GPUs.

The chip maker has included features that make streaming and broadcasting games faster and easier. Its latest GeForce graphics cards can stream games from PCs to the company's Shield handheld console gaming tablet, and 4K streaming could come in the future. New features allow for smoother game-play broadcasting on Twitch.tv, a live video-game streaming service that is being acquired by Amazon in a deal worth $970m.

NVidia competes in the GPU market with Advanced Micro Devices (AMD), whose chips are used in the Sony PlayStation and Xbox One gaming consoles. The GTX GPUs compete with AMD's latest Radeon R9 graphics chips, which have proprietary technologies to boost gaming.

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Amazon's Fire Phone set to fail in UK

The smartphone will struggle to compete with other new devices from Apple and Samsung. Mikael Ricknås explains

Amazon's Fire Phone has gone on sale in the UK and Germany, but finding success in Europe will be even harder than in the US, where the device has struggled to make a mark.

The company has signed deals with O2 in the UK and Deutsche Telekom in Germany, which started shipping on 30 September.

Amazon's first try at breaking into the highly competitive smartphone market was originally announced in June for the US market, and started shipping in July. It uses Amazon's Android-based Fire OS, has a 4.7in screen and a 13Mp camera.

The device hasn't had an easy time in the US, with Amazon and AT&T dropping the price with a two-year contract from $200 to 99 cents on Monday. In the UK and Germany, the Fire Phone will be free with a contract. Despite this, breaking into these two markets won't be any easy.

"I think the Fire Phone will be in for a tougher time in the UK and Germany. Not only has the phone received poor reviews in the US and has little momentum behind it, but there is also a lot more uptake of Amazon's services in the US relative to the UK or Germany," argued Daniel Gleeson, senior analyst at market research company IHS.

The bar has become higher for new mobile phone entrants, in general. Consumers are more conservative about their buying choices, as many have already picked and invested in an operating system including the apps and services that come with it, according to Nick Spencer, senior practice director at ABI Research.

"People in particularly Western Europe and North America are, with subsidies, more than happy to pay the money to go for a recognised and trusted brand," he said.

Amazon has set out to differentiate the Fire Phone from competing devices with a number of features. They include the 'Dynamic Perspective' technology, which allows for one-handed gestures to control the phone and the creation of 3D effects. There is also Firefly, a feature that uses a dedicated button and can identify phone numbers, artwork, songs, TV episodes, as well as books and DVDs.

So far, that hasn't been enough. Part of the reason why the Fire Phone has struggled is because the user experience isn't as good as on competing products, Gleeson said.

The Fire Phone European adventure won't be made easier with the device going on sale at the same time as Apple's iPhone 6s, according to Gleeson. It will also compete with recently announced smartphones such as the Moto X and G from Motorola and Samsung's Galaxy Note 4. These devices that are highly anticipated and already have a fan base.

But even though the Fire Phone is off to a tough start, Amazon shouldn't give up, argued to Gleeson. The company is very new to the smartphone arena and the Fire Phone is only its first product.

"I expect the next generation will be a vast improvement on the current version. Particularly when it has had time to fix all the bugs and really develop that unique user interface. That interface has a lot of potential, but it hasn't been fully exploited yet," he said.

PC confusion to linger on Intel's quick jump to Skylake

Intel sweeps Broadwell under the floor at IDF, pushes Skylake, reveals Agam Shah

Laptop and desktop buying decisions may get a little confusing in 2015 as Intel introduces PC chips based on two different architectures – Broadwell and Skylake – in the same year, something the chip maker rarely does.

Mainstream PCs with chips based on the Broadwell architecture – Intel's fifth-generation Core processors – will ship in the first quarter of next year. However, in the second half of 2015, users will be able to buy PCs with processors based on the newer Skylake architecture, which will bring wire-free computing and significant performance upgrades.

Intel wants to bring the latest technology to buyers as quickly as possible, and would like to close the curtain on Broadwell's troubled existence. Mainstream PCs with Broadwell were expected this year, but were delayed following manufacturing issues that delayed chip shipments.

Skylake chips will have the biggest PC innovations in the past 10 years, Intel believes. They will bring wireless charging and data transfers, and also a "significant increase in performance, battery life and power efficiency," revealed Kirk Skaugen, general manager of Intel's PC Client Group, during its recent Intel Developer Forum.

The company almost swept Broadwell PC chips under the floor at IDF, except for showing a handful of PCs like a small desktop. Consumers will continue buying laptops and desktops as and when needed, but those who care about performance and features may pass on Broadwell and wait for Skylake, analysts said. The likelihood of people waiting for Skylake PCs will increase as the year goes along.

Broadwell in PCs will have a shorter life with Skylake looming, and the feature upgrades may be a good reason for some to wait, explained Jim McGregor, principal analyst at Tirias Research.

"If you're really a technophobe, you may want to wait for Skylake," he said.

The transition to Skylake will also lead to Intel dumping Broadwell processors, which could help cut laptop prices by year end. That could benefit customers looking for low-cost laptops and prop up PC shipment volumes, McGregor said.

Desktop upgrades may be done on Skylake, which could happen first in 'niche' PCs, said Dean McCarron, principal analyst at Mercury Research. "There's always going to be that class of users that's waiting to buy the latest technology. If that user's buying in May, they can wait a few months to buy a Skylake," McCarron revealed.

Intel has a 'tick-tock' strategy where PC chips are upgraded every 12- to 18 months. However, manufacturing glitches delayed the release of PCs with fifth-generation Core processors. That has led to a longer life for fourth-generation Core chips based on the current Haswell architecture.

The upcoming Broadwell PC processors will consume a minimum of 15W of power. They are different from low-power Core M chips, which are also based on Broadwell and consume 4.5W. The Broadwell and Skylake chips are made on the 14-nanometer process.

The delay of Broadwell's mainstream PC chips to next year raised questions on whether it would have a rollover effect on Skylake, pushing it into 2016. But Intel does not want to delay chips and give competitors a chance to gain ground, McCarron said.

"Intel learned a lesson in the Pentium 4 days, that you're not far ahead of your competition," McCarron said.

The chip maker became too attached to the Pentium 4, which got minor architectural and manufacturing upgrades from 2000 to 2008. Intel's sluggishness helped Advanced Micro Devices – which bought innovations to its Athlon processor chips – gain PC processor market share. That woke up Intel, which then switched its architectural approach with Pentium D and subsequently Core processors, both of which succeeded.

Nonetheless, the company will aggressively push Broadwell in laptops early next year, McCarron explained.

Why local multiplayer gaming is rapidly vanishing

Adam Shepherd looks at the demise of split-screen and LAN game modes

Quick. Name your number one formative gaming experience. I'm willing to bet money that a fairly large proportion of your answers involved other people. Maybe it was learning that the world is a cold, unforgiving place at the hands of E. Honda and that one guy who knew how to pull off the 100-hand slap. Maybe it was staying up well into the night with your friends, blowing chunks out of each other in Timesplitters 2. Whatever the case may be, the fact remains that the social capabilities of the medium played a key role in turning gaming into the pop-culture juggernaut it is today.

However, the days of gathering your buddies together with six litres of Fanta and enough Wotsits to sink the Bismarck are fast disappearing. No more can you distract your opponent with a swift elbow to the ribs, while you digitally eviscerate them. No more are you pelted with stale corn-based snacks for spamming Marshall Law's unblockable flip in Tekken 3 for five straight matches in a row. Instead, we sit hunched over a single gamepad, crying tears of desperate frustration as we frantically try and escape being knifed in the back by a 14-year-old kid in Taiwan, while he cackles and calls us a 'looser'.

TIMESPLITTERS 2

Even when we know the people we're playing against, it's not the same. We're still on our own and those digital avatars, though still controlled by our real-world friends, hold no more connection to us than the thousands of nameless victims we mow down in pursuit of the next achievement. You can't glance over at the guy next to you and see the look in his eyes as you lap him for the fourth time, and he can't look back, revelling in the knowledge that soon he's going to wipe that giant smug grin off your face.

It somehow makes the experience much more rewarding, with actual partners creating a sense of manic energy as you all constantly berate and belittle each other.

The death of local multiplayer is one of the biggest tragedies of modern gaming, as former bastions of couch-based camaraderie slowly succumb to the lure of online-only. Titles such as SSX, Need For Speed and Call of Duty, all classic go-to multiplayer titles, are all scaling back or abandoning altogether their split-screen options, and it feels a lot like those seeking to share an experience with friends or flatmates will be left permanently out in the cold. For those who remember the youthful bonding experiences of Crash Team Racing or endless 'winner stays on' Soul Calibur matches, it's an integral part of the gaming experience that will be sorely missed.

Don't get me wrong, online multiplayer has its place, and the ability to play with friends all over the world is a fantastic invention. But in our haste to join the dots, and to fill in the blank spaces on the map, lets not forget our roots. We were all kids once, fighting over Player One, and unpausing while our mates were in the bathroom to get some sneaky shots in. Maybe it's just nostalgia talking, but are these experiences worth sacrificing just for intercontinental virtual murder? I'd argue that they're not, and the success of things like Two Best Friends Play would suggest that I'm not the only one, and we all still have a soft spot for talking smack on a couch with our buddies.

Sadly, there aren't many modern games that allow you to play with another human being in the room, and the Borderlands' of the world are few and far between. Thankfully, the indie scene is here to help, with a raft of titles such as Broforce, Castle Crashers and numerous ports of classics like Double Dragon to provide you with that unmistakable experience of playing a game with some of your best buddies, while you call each other every possible name under the sun, and threaten to start fights if they don't quit being such a cheap, button-mashing asshole, Chad. And that, more than any other reason, is why I play games. Not for a jaw-dropping Skybox or 300 hours of playtime, but for the fun of it, and for escaping with friends into a world of fantasy. ☒

Apple lays groundwork for global LTE roaming with new iPhones

The company almost triples the number LTE bands on the iPhone 6 and 6 Plus. Mikael Ricknås reports

By increasing the number of LTE bands to an astonishing 20 on the iPhone 6 models, Apple has paved the way toward global data roaming for the wireless technology. Now mobile operators just have to get their act together and agree on deals to make it a reality.

At the end of July there were 318 commercial LTE networks in 111 countries. Unfortunately, most of these are virtual islands, thanks to the technical complexity of implementing all of them on smartphones and tablets. However, with the iPhone 6 and 6 Plus, Apple has managed to get over that hump.

"I think this will matter a lot, actually. Because the new iPhones aren't just supporting the mainstream frequencies, but also up and coming bands such as 700MHz," explained Alan Hadden, president at GSA (Global mobile Suppliers Association), which keeps track of LTE's expansion.

Apple offers two different LTE configurations on the new iPhones, with either 16- or 20 bands. That's a huge improvement compared to the seven bands found on versions of the iPhone 5s and 5c on sale in Europe, as well as parts of South America and the Middle East.

Buyers of the iPhone 6 and 6 Plus in these parts of the world will be the big winners. For example, the 20-band model that will go on sale in Europe will work in Japan and the US and vice versa, according to Apple's LTE website. Those models are also compatible with TD-LTE, which is used in China, India, Brazil, some parts of Africa and by Sprint in the US.

TD-LTE or LTE TDD (Time-Division Duplex) uses one channel for both upload and download traffic, compared to LTE FDD (Frequency-Division Duplex), which uses separate channels for download and upload traffic. The latter technology is used by a majority of networks. The models that Verizon Wireless, AT&T and T-Mobile will sell have 16 bands, which is five more than was available on the their versions of the iPhone 5s and 5c. One of the bands Apple has added is 2600MHz, which is widely used in Brazil, Hong Kong and Europe. They lack support for TD-LTE, but still have enough bands to be used in most parts of the world.

Getting all the bands in place is only the first step, mobile operators have to agree on roaming deals that tie together their networks. Operators such as Orange, Swisscom, Telstra, TeliaSonera and Vodafone are leading the way, and some of them think Apple's upgrade can help increase the interest for international roaming.

More LTE bands supported should allow our subscribers to enjoy LTE speeds when they take their device abroad and we hope this will help an increasing number of users roam when abroad, according to Orange. ☒

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We bring you the pick of the crop from the IFA 2014 technology show

Samsung Galaxy Note Edge

Smartphone

One of the most interesting smartphones to launch for years is the Note Edge with its new take on the curved screen. In essence, it's a Galaxy Note 4 with an additional screen section on the side that can be used to display icons, notifications and more. A UK release for the device is still up in the air.

Around £650 inc VAT
samsung.com/uk

CHRIS MARTIN

Sony Xperia Z3 Tablet Compact

Tablet

Sony has finally made a smaller tablet and the hard-to-pronounce device is one of the thinnest around at 6.4mm. The 8in Z3 Tablet Compact has Sony's classic style and is water-resistant. Key features include support for high-res audio playback and PS4 Remote Play.

£329 inc VAT
sonymobile.com/gb

Apple Watch

Smartwatch

The Apple Watch wasn't unveiled at IFA, but it was one of this month's biggest launches. Set to be released early next year, it will come in two sizes, various colours and have interchangeable straps. The watch also features a digital crown, heart rate monitor, NFC and a Retina display.

$349 (UK price TBC)
apple.com/uk

Samsung Gear VR

Virtual reality headset

Rather than an Oculus Rift rival, the firm has teamed up with Samsung on the Gear VR. It offers a 96-degree field of view and a touchpad for control. The price might seem outstandingly affordable but you'll need to slot in a Galaxy Note 4 for it to work.

£150 inc VAT
samsung.com/uk

Lenovo Tab S8

Tablet

Lenovo's latest effort is a contender for best-value tablet with its sub-£150 price tag. Not only is the Tab S8 well built, it also comes with decent specs. Its 8in screen offers 1920x1200 resolution, and there is a 64-bit Intel Bay Trail-T Atom Android L-ready processor and front-facing stereo speakers.

£149 inc VAT
lenovo.com/uk/en

Sony Xperia Z3 Compact

Smartphone

We liked the Xperia Z1 Compact and are even more impressed with the Z3 Compact. It has a larger 4.6in screen in a slimmer and lighter body, new colours and many of the full-size Z3's features, including a 20.7Mp camera, high-res audio and PS4 Remote Play.

£429 inc VAT
sonymobile.com/gb

LG G Watch R

Smartwatch

The hype around the Moto 360 has been monumental, so LG has quite rightly announced its own round smartwatch. It runs on Android Wear and has almost identical specs to its rivals, which makes the design the unique selling point. The device will come in black or silver with a leather strap included.

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lg.com/uk

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Asus ZenWatch

Smartwatch

Asus has joined the smartwatch party with the ZenWatch. The wearable gadget runs Google's Android Wear OS, and features a stainless steel case, leather strap and 1.63in 2.5D curved screen.

£199 inc VAT
asus.com/uk

Elgato Avea

Smart light bulb

Elgato's Avea bulb allows iOS users to create dynamic lighting scenes from the app. There are seven scenes and colours. It works straight out of the box, with no bridge or gateway required.

£39 inc VAT
elgato.com/uk

Acer Iconia Tab 8W

Tablet

With Microsoft offering Windows free to partners for devices smaller than 9in, we're seeing a raft of small and cheap Windows 8 tablets. Acer's is 8in and has a 1200x800 IPS screen, an Intel Atom Z3735G quad-core processor, 1GB of RAM and 32GB of storage.

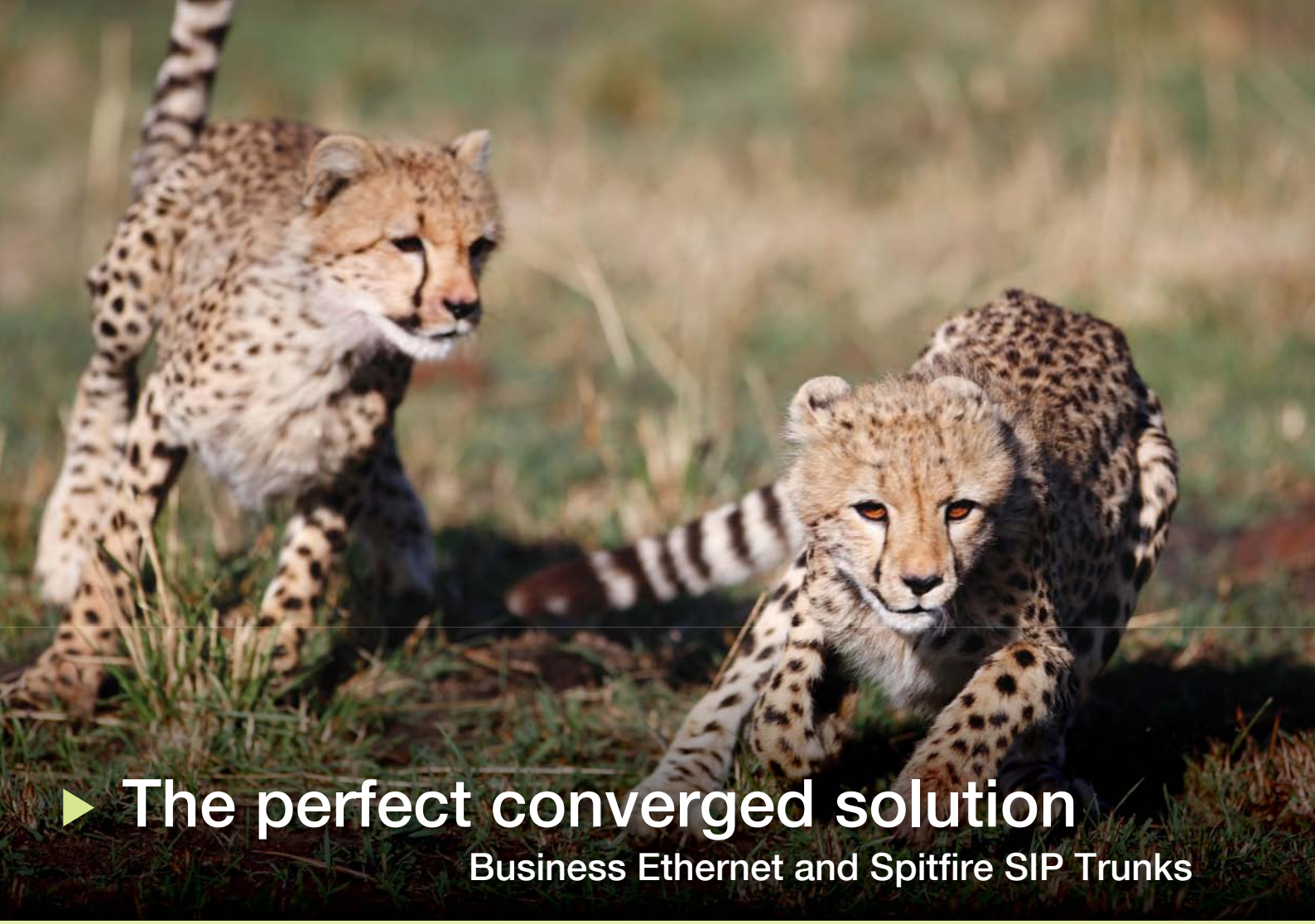
€149 inc VAT (UK price TBC)
acer.co.uk

Motorola Moto X (2014)

Smartphone

The second-generation Moto X has some nice upgrades including a Full HD 5.2in screen and a 13Mp camera. The Moto Maker has now reached the UK so you can custom-build it with different colours, materials and engraving – although some cost extra.

£419 inc VAT
motorola.co.uk



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* Cost comparison: One year BT Retail contract: 10 ISDN30e channels + 100 DDI quota + CLIP = £218.00 per month. Spitfire: 10 SIP Trunks + 100 DDIs + CLIP + 1Mb additional Etherflow bandwidth on existing spitfire Ethernet = £74 per month (Etherflow = Metro Band 2A). Existing 2Mb leased line @ £45 per month compared with Spitfire 2Mb Ethernet leased line from £180.00 per month.

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

★★★★½

This overclocked gaming PC combines smooth gameplay with workstation-like build quality, and features the Core i7-4790K Devil's Canyon CPU running at 4.6GHz.

The latest Intel processors in 2014 are still codenamed Haswell, and mainstream CPUs for desktop PCs such as the Core i5-4690 and Core i7-4790 received a welcome – if somewhat unexciting – 100- to 200MHz speed increase this year.

Updated versions of the unlocked K-suffix chips use the new codename 'Devil's Canyon' to separate them from the standard versions.

To provide better overclocking performance Intel has improved the internal thermal compound and updated the on-chip voltage regulator. The result is the Intel Core i5-4690K and i7-4790K, which promise speeds as high as 5GHz with air cooling alone.

With the help of Chillblast's Devil's Canyon-powered Fusion Dragon PC, we find out how the new chips stack up against the old, and whether it's time to ditch your Haswell system.

Build and components

At £1,700, the Fusion Dragon is more expensive than the gaming PCs you'll usually see in our PC group tests. But the quality is evident even before you turn on the PC.

Housed in a Corsair Graphite Series 760T full-tower case, this is no compact PC. Its arctic white finish and 564x246x568mm dimensions give it an almost fridge-like appearance. A look that is enhanced by its hinged side doors.

Unlike the puny transparent side-panel built into many gaming cases, the whole side of the Graphite Series 760T is a transparent door that swings open to provide easy access to the internals. Just grab the latched handle and open the door.

The inside of this PC is extremely tidy: you'll have to look very closely to see any cables – most have been hidden from view, carefully tucked away using the case's built-in cable-management features. The motherboard also contributes to this look with its built-in shielding.

On the other side of the case, a second door provides full access to the rear of the motherboard to enable you to swap the CPU cooler without removing the motherboard. It also reveals the nest of cables, invisible from the front of the board.

Eight fan mounts are provided, with a pair of 140mm fans installed at the front illuminated by white LEDs, and a 140mm fan at the rear.

Externally, the front of the case provides two USB 3.0 and two USB 2.0 ports for convenience. There's also a fan-speed button, headphones and mic ports, a reset switch and a larger power button.

Nine internal 3.5in drive bays are provided, with the 2TB Seagate hard drive and 240GB Samsung 840 EVO SSD housed in two of these. There are also four SSD bays; Chillblast has elected not to use these.

Three 5.25in external bays are provided, one of which has been fitted with 24x DVD±RW drive.

An Asus Sabertooth Z97 Mark 1 motherboard is installed, which comes with 'TUF Frontier shielding'. This encases all parts of the motherboard that don't need to be exposed in a textured plastic cover.

This is used to improve cooling and prevent damage to components. It has been designed with reliability in mind, and features dust defenders and customised fan-tuning options. Don't get side-tracked by the cheaper Mark 2 version of this board, which lacks the shielding.

The motherboard is fitted with an Intel Z97 Express chipset, which supports fourth-generation (Haswell and Devil's Canyon) Core processors, as well as the forthcoming Broadwell chips. It enables overclocking of the CPU, which Chillblast has put to good use in the Fusion Dragon.

A sealed Corsair H100i liquid-cooling unit manages the CPU temperature. Its large, 240mm radiator is fitted to the top of the case where it is cooled by a pair of 120mm fans. It features 'Corsair Link', which allows for monitoring of temperatures and adjustment of the cooling performance from a desktop application.

Graphics are provided by a 3GB GeForce GTX 780Ti card, which is nVidia's fastest single-GPU offering.

This FKA2-branded model offers a standard design without any special cooling or substantial overclocking. The motherboard also supports nVidia Quad-GPU SLI if you want to add multiple nVidia cards, plus AMD Quad-GPU CrossFireX, should you wish to switch to AMD cards in the future.

The system is backed by a Corsair RM850 modular power supply, which is 80 Plus Gold-certified and engineered for quiet operation. Its built-in low-noise fan will stop entirely when it's not needed. The 850W rated output is more than ample for this system – even when overclocked.

The Fusion Dragon is therefore pleasantly quiet. This is due to quiet fans and components rather than any specific soundproofing so you will notice a little noise when it's working flat out, but most of the time it runs at a mere whisper.

Performance

The Fusion Dragon is fitted with a 4GHz Intel Core i7-4790K processor, overclocked to 4.6GHz. It performed very well in our tests. The overclocked CPU helped it to achieve very high scores across the board.

PCMark 7 recorded an overall score of 7040 points, with an Entertainment score of 6927 points. Moving to PCMark 8, we measured a Home score of 5495 points, while Alien vs Predator ran smoothly at 101fps at 1920x1080 pixels, with all the quality settings maxed out.

Overclocking can require a significant increase in component voltages, and power consumption is correspondingly high with the Chillblast running at 113W when idling at the desktop. This ramped up to 420W running our torture tests. However, the Fusion Dragon's excellent cooling system kept the processor running at a maximum 66ºC, even under the heaviest loads.

Although the benchmark scores are high, they're not as stellar as we might have expected before the Devil's Canyon chips became available. President of Intel Renee James' oft-quoted claim that the Core i7-4790K would overclock to 5GHz with air cooling has failed to be realised in real-world systems, where 4.7GHz appears to be a more realistic top speed for the best samples of the chip.

Much of the boost in performance comes from the 4GHz base clock of the processor, which is a comparatively large 500MHz leap in frequency from the previous Core i7-4770K. The performance gain achieved through a little more overclocking is therefore rather less impressive than we had hoped.

In our tests, the Core i7-4790K achieved a maximum of around 6 percent better performance than a Core i7-4770K with both chips running at their stock speeds. Overclocking both chips roughly halved this gap in performance.

Largely limited by the graphics card, gaming performance is barely affected by overclocking or swapping processors. While performance at stock speeds should be reproducible with any processor of the same specification, overclocking performance can vary greatly from chip to chip and, according to Chillblast, a 'good' Haswell chip will easily beat a 'bad' Devil's Canyon chip when both are pushed to the limit.

With these results in mind, we certainly wouldn't recommend upgrading your original Haswell system to Devil's Canyon now. However, as the new chips are available at the same price, there's now no point in buying a PC with an older Core i7-4770K unless it's at a discounted price.

You could save some money by opting for a Core i5 rather than a Core i7, and this might make sense in a budget gaming system, but in a £1,700 PC such as the Fusion Dragon we hardly think the £80 saving would be worth it.

Aside from the boost in clock speed, the Core i7-4790K offers a near-identical specification to the Core i7-4770K. Both are unlocked quad-core chips, featuring Hyper Threading and integrated Intel HD Graphics 4600 GPUs.

It's a similar situation with the Core i5 processors, although the 4690K offers only a 100MHz speed boost over the 4670K.

We're told the key difference in the new Devil's Canyon chips is in the new Next-Generation Polymer Thermal Interface Material used to improve processor cooling, plus the addition of some extra capacitors, designed to smooth power input. Both are features designed to reduce running temperatures and increase overclocking headroom.

We've seen already that the overclocking performance of the Core i7-4790K has proved to be little better than previous processors. However, our tests also showed that the Devil's Canyon chip ran nearly six degrees cooler than the original Haswell version when fully overclocked, despite running faster. This helps reduce fan speeds and therefore noise.

If you already have a decent Haswell PC with an overclocked Core i7 processor then it's not worth buying a PC such as this simply to upgrade to Devil's Canyon. However, if you're buying a new system or upgrading from something much older, the Chillblast Fusion Dragon is a great example of a Devil's Canyon gaming PC that offers ample upgrade potential to future processor generations.

Verdict

The Chillblast Fusion Dragon is a great performer and is built to a very high standard, with high-quality components throughout. The large system case provides excellent internal access for those who like to tinker and upgrade. ☒ **Paul Monckton**

LAPTOP-TABLET HYBRID

Microsoft Surface Pro 3

From £639 inc VAT

Contact
- microsoft.co.uk

Read more
- tinyurl.com/neLnz52

Specifications
Windows 8.1 Pro; Intel Haswell Core i3/i5/i7 processor; up to 8GB DDR3 RAM; up to 512GB SSD; 12in ClearType full-HD (2160x1440, 216ppi, 4:3) multitouch display; USB 3.0; 802.11a/b/g/n/ac Wi-Fi; Bluetooth 4.0; Mini DisplayPort; 2x 5Mp cameras (front and rear); stereo speakers with Dolby sound; Surface Pen; battery life up to nine hours (web browsing); 292x201.3x9.1mm; 800g

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

★★★★☆

Microsoft markets the Surface Pro 3 as 'the tablet that can replace your laptop'. It's a fair claim: the Surface Pro 3 is not an iPad rival, or at least not only an iPad rival. Microsoft has set out to create a device that is both powerful and portable. A laptop and a tablet, and also a desktop PC.

It's a 12in slate that runs full Windows and has wireless connectivity as well as USB 3.0 and DisplayPort. For a 12in computer it is thin and light. It is perfectly feasible as a good portable laptop, and an acceptable if heavy tablet. But is that what people want?

I've been carrying around the Surface Pro 3 for a few days now. It is the most portable power laptop I have ever carried, but even despite improvements on previous models it isn't better to use than a laptop. And although it is possible to use the Surface Pro 3 as a tablet for the consumption of movies and e-books, and for social networking, it's a very big and heavy slate.

There are two significant changes to the Surface Pro 3 when compared to its predecessors. The first is the display, now 12- rather than 10in; the second is a new Type Cover that has a wider touchpad and a two-angle setup that allows for a better typing experience in laptop mode. The kickstand integral to the Pro 3 now has multiple points, too, letting it be secured at any angle.

Five configurations are available, costing from £639 to £1,649. As a high-spec, powerful and portable laptop, the Pro 3 is pretty cheap.

Build and design

Despite its 12in display, the Pro 3 doesn't feel too big. With more room inside in which to fit components, Microsoft has been able to make the Pro 3 the thinnest Core PC ever.

Our Core i5, 128GB Surface Pro 3 weighs 813g. Add in the Type Cover and the weight goes up to 1,110g; add the Surface Pen and it's 1,128g.

Build quality is universally excellent. Despite the light weight the Surface Pro 3 feels strong. It has a metallic feel, but the texture bears many of the characteristics of plastic. The back has a silver-effect finish, with a simple 'Surface' logo.

Around the sides is a similar finish, with the thin gap we have seen on previous devices. This may be required for airflow, but tends to also attract dust. Ports, including a full-size USB 3.0 and DisplayPort, an on/off switch and volume controls live around the edges. The camera aperture is at the top of rear panel – two 5Mp cameras are fitted, which is what you'd expect from a laptop rather than a smartphone or tablet.

Around the front, the Pro 3 is a single sheet of edge-to-edge glass. The Windows symbol sits to the right in landscape mode, or at the bottom in portrait. Switch on the screen and the bezels are impressively small.

The display is a 12in ClearType full-HD Plus multitouch panel. It is noticeably sharper than the previous generations of Surface Pro, and a native resolution of 2160x1440 makes for a decent 216ppi density.

Whereas the aspect ratio was previously 16:9, the Surface Pro 3 is a 3:2 device. Open it in portrait mode and it feels like an A4 pad.

Type Cover and pen

For the uninitiated the Type Cover is a must-have, although not a cheap addition at £109. It attaches to one side of the Pro 3 using a magnet, then works like a book cover to protect the display.

Fold it out and it works as a keyboard that can be set flat against the desk or at a more keyboard-like angle. The keys have enough travel to make typing feasible. We'd rather use a full-sized laptop keyboard, but in the absence of that the Type Cover is the next best thing.

The expanded trackpad has distinct left- and right-click zones, and it supports gesture control. The Surface Pen comes free with Surface Pro 3. Click it on and your OneNote launches to let you quickly capture and save a note – even if the Pro 3 is locked. The pen works with any app that uses ink and feels accurate when writing or drawing.

Performance

Each Surface Pro 3 comes with a fourth-gen Intel Core processor, either i3, i5, or i7. This is paired with 4- or 8GB RAM, and between 64- and 512GB of solid-state storage. We tested the Core i5 model with 4GB of RAM and 128GB storage.

In real-world use the Surface Pro 3 is zippy and fast, even under load and attempting multiple processes.

In PCMark 7 the Surface Pro 3 turned in 4864, a healthy score that is 200 points higher than that of the 13in MacBook Air.

Microsoft claims up to nine hours of web browsing use, putting the Surface Pro 3 firmly in the MacBook Air class of all-day battery life. And it's not exaggerating: more than 24 hours after we began using the Pro 3 half the battery remained.

Verdict

A very decent laptop replacement and an okay tablet, the Surface Pro 3 is undeniably impressive. If you need a single device to do everything we can't think of a better one. And when you consider the cost of buying a discrete laptop, tablet and desktop, the Surface Pro 3 is priced to shift. The question remains as to whether people want a single device to do it all. ☒ **Matt Egan**

TABLET

Samsung Galaxy Tab S 10.5

PC ADVISOR RECOMMENDED

£399 inc VAT

Contact
- samsung.com/uk

Read more
- tinyurl.com/oesdfzq

Specifications
Android OS 4.4.2 (KitKat); 10.5in (2560x1600, 288ppi) Super AMOLED capacitive touchscreen; Exynos Octa-core processor; microSD up to 128 GB; 16/32GB internal storage; 3GB RAM; GPRS; 802.11 a/b/g/n/ac, Wi-Fi Direct, dual-band, DLNA; Bluetooth 4.0 LE with A2DP; IR blaster; fingerprint scanner; GPS; Micro-USB v2.0 (MHL 2.1); stereo speakers; 3.5mm jack; 8Mp stills/1080p video @30fps; 2.1Mp front camera; non-removable lithium-polymer 7900mAh battery; 247x177x6.6mm; 465g

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

★★★★½

Samsung's Galaxy Tab S range consists of two models, the 10.5in tablet reviewed here, and the 8.4in Tab S reviewed overleaf. Both are available in 'Dazzling White' and 'Titanium Bronze'.

At £399, the Tab S 10.5 is well priced to take on key rivals the iPad Air and Sony Xperia Z2 Tablet.

Design and build

The Tab S looks very similar to previous Samsung tablets, although it takes a few design touches from the Samsung Galaxy S5. Like the smartphone it has a dimpled plastic rear cover, which feels cheap in contrast to the device's metal edge, a physical home button and a pair of touch-sensitive keys. There is also a fingerprint scanner.

Two circles on the rear work with Samsung's Book Cover. This accessory clips on to the tablet and holds on tight. It's available in various colours and allows you to tilt the tablet into four viewing positions.

The Tab S is just 6.6mm thick, making it thinner than the iPad Air but not quite as petite as the Sony Xperia Z2 Tablet. At 465g it's nice and light for a tablet with a large screen, and it's easy enough to hold it one-handed for a reasonable amount of time. That's lighter than the iPad Air, but Sony's tablet is an even lighter option.

Unlike Samsung's S5 and the Xperia Z2 Tablet, the Tab S is not dust- or waterproof.

Samsung claims 50 percent of tablet owners use their tablet for watching, or reading content, so it makes sense for it to also claim the Tab S has the "world's greatest screen" for a tablet.

At 10.5in and with a 16:10 aspect ratio this display is well suited to watching films and TV shows. The resolution is extremely high, at 2560x1600, and stunningly crisp with a pixel density of 280ppi.

This Super AMOLED panel makes content look great but, as we've found in the past, it can be a bit over the top. An adaptive display mode aims to adjust the display's gamma, saturation and sharpness, depending on the content to hand.

Samsung has also supplied a pair of stereo speakers, even if they are side-mounted.

The Tab S 10.5 is packed with technology, including an IR blaster and a fingerprint scanner. It supports 802.11ac Wi-Fi, Bluetooth 4.0 and GPS, but not NFC. A 4G LTE model is also available, adding roughly £100 to the price.

You get a choice of 16- or 32GB of storage, and a microSD slot lets you add a further 128GB.

A generous 3GB of RAM is coupled with Samsung's Exynos 5 Octa processor, which has four 1.9GHz cores and four 1.3GHz cores. The more powerful cores are employed for demanding tasks, while the remaining four place less strain on the battery when the tablet is busy with simpler tasks.

The Tab S performed very well in our benchmarks, with 2769 points in Geekbench 3 (slightly higher than the Xperia Z2 Tablet). It was also very close to its Sony rival in SunSpider with 1079ms.

However, in our graphics benchmark, GFXBench 3.0 T-Rex, the Tab S underperformed with just 14fps. This is in comparison to the Xperia Z2 Tablet's 27fps.

And it's not just in the latter benchmark that the Tab S struggled: we found it surprisingly laggy on occasion, even when it wasn't under a particularly great load.

Should you really want to take a photo on a 10.5in tablet, the Tab S 10.5 is well-equipped with an 8Mp rear-facing camera with an LED flash. There's also a 2.1Mp front camera for video chat and selfies.

Software

The Galaxy Tab S 10.5 runs Android 4.4.2 KitKat with Samsung's latest TouchWiz software. It looks just the Galaxy S5 interface, with the same icons, widgets and drop-down notification bar.

We like the way recent apps pop up at the bottom of the screen rather than taking over completely, and you can swipe in from the right to access Multi-Window, which lets you run two apps side-by-side.

Another handy item if you have a compatible Samsung smartphone is SideSync 3.0, which lets you respond to calls and text messages.

The Magazine UX makes sense only if you use the built-in email and calendar apps – use Google's alternatives and nothing will appear here, and you can't remove it.

Runtime is excellent, thanks to a high-capacity 7900mAh battery. In standby it holds its charge incredibly well, and even when used to watch video you'll get around 12 hours playback from the Tab S.

Verdict

The Galaxy Tab S 10.5 is one of Samsung's best ever tablets. It has a thin and light design, although there is still too much plastic. Hardware is decent, with an impressive display and great battery life. It's got pretty much everything you could want in a tablet, and it is priced competitively against its key rivals. A worthy winner of our Recommended award. ☒ **Chris Martin**

TABLET

Samsung Galaxy Tab S 8.4

PC ADVISOR GOLD

£319 inc VAT

Contact
■ samsung.com/uk
Read more
■ tinyurl.com/kL6g9fj

Specifications
Android OS 4.4.2 (KitKat); 8.4in (2560x1600, 319ppi) Super AMOLED capacitive touchscreen; Exynos Octa-core processor (1.9GHz & 1.3GHz); microSD up to 128 GB; 16/32GB internal storage; 3GB RAM; GPRS; 802.11a/b/g/n/ac, Wi-Fi Direct, dual-band, DLNA; Bluetooth 4.0 LE with A2DP; IR blaster; fingerprint scanner; GPS; Micro-USB v2.0 (MHL 2.1); stereo speakers; 3.5mm jack; 8Mp stills/1080p video @30fps; 2.1Mp front camera; non-removable lithium-polymer 4900mAh battery; 126x213x6.6mm; 294g

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

★★★★½

A smaller version of the Tab S 10.5 reviewed on the previous page, the Tab S 8.4 is one of the best compact tablets we've ever reviewed, taking on the likes of the iPad mini 2 and Google Nexus 7.

It's priced to match Apple's mini at £319, and like that tablet you can add mobile connectivity at extra cost. The Nexus 7 is cheaper, albeit not as powerful, available from £199.

Design and build

As with its bigger brother, the Tab S 8.4 comes in Dazzling White' and 'Titanium Bronze'. It's also very thin and light, just 6.6mm thick and 294g, making it easy to hold in one hand.

The design is very 'Samsung', and the Tab S 8.4 takes the dimpled plastic rear cover, physical home button and fingerprint scanner from the Galaxy S5 smartphone.

The Tab S 8.4 is, like the 10.5, compatible with Samsung's Book Cover, which explains the two odd-looking circles on the rear. Not only does it protect the screen but it allows you to tilt the tablet in four viewing positions.

Despite the slimmed down chassis and smaller price tag, the Tab S 8.4 shares many of its hardware specifications with the Tab S 10.5, in our view making it the better buy.

So, while the screen is a couple of inches smaller, it adopts the same 16:10 aspect ratio and whopping 2560x1600 resolution, producing a higher pixel density of 359ppi. In fact, that's the highest pixel density we've seen on a tablet.

The quality shows: this Super AMOLED panel is amazingly crisp and clear, and totally lives up to Samsung's claim that it has the "world's greatest screen" for a tablet. The punchy colours can be a little oversaturated, but an adaptive display mode adjusts the gamma, saturation and sharpness depending on the content.

Side-mounted stereo speakers are better than no stereo speakers, and combined with the high-res screen make this a fantastic tablet for watching films, browsing photos and playing games. They pack a reasonable punch, but quality deteriorates at high volume levels.

Unlike its rivals the Tab S 8.4 features both an IR blaster (oddly this is found on the device's side) and a fingerprint scanner.

Storage is 16- or 32GB, plus you can add a microSD card up to 128GB in capacity.

The Tab S 8.4 is fitted with the same processor and RAM combo as its bigger brother: you get Samsung's Exynos 5 Octa-core processor, with four 1.9GHz- and four 1.3GHz cores, plus 3GB of memory.

It's no surprise that it performed almost identically to the 10.5 in our benchmarks. In Geekbench we saw 2675 points; SunSpider measured 1089ms; and in GFXBench the Tab S 8.4 turned in the same lowly 14fps.

From a user perspective, performance is smooth. But, as with the Tab S 10.5, at times we found the 8.4 laggy, even when it wasn't under a significant load – sometimes just switching on the screen or opening an app could hold us up.

Connectivity wise you'll find 802.11ac Wi-Fi, Bluetooth 4.0 and GPS, but no NFC.

The smaller Tab S 8.4 is more likely to be used for photography than its larger sibling, so it's good to see the same camera setup. You get an 8Mp rear camera with LED flash, plus a 2.1Mp front camera. Both cameras are of decent quality.

Software

Alongside Android 4.4.2 KitKat Samsung has preinstalled TouchWiz. As we mentioned in our review of the Tab S 10.5, this is not our favourite mobile OS overlay. However, it has both good and bad points, and whether you like it will largely come down to personal taste.

This interface mirrors that of the Galaxy S5, with the firm's own icons, widgets and drop-down notification bar. We like the Multi-Window multitasking functionality, and the Recent apps menu pleasingly won't take over the entire screen. SideSync 3.0 is also useful when paired with a Samsung phone, letting you respond to calls and texts on the tablet.

There's is a multitude of quick-access buttons in the notification bar, including sliders for brightness and volume.

The Magazine UX is much like HTC's BlinkFeed, sitting to the left of the main home screen and providing content tailored to your interests. The calendar and email sections will be useful only if you use Samsung's own apps, however.

A load of free content is up for grabs via Galaxy Gifts. Having submitted a proof of purchase form online, Samsung will let you download some apps for free, including RunKeeper and Cut the Rope 2. Even better are the three- and six-month free subscriptions to Sky's Now TV service and Deezer.

Battery life isn't as good as with the Tab S 10.5, given the smaller 4900mAh battery. We found with average use it would last a few days.

Verdict

The Samsung Galaxy Tab S 8.4 is one of the best Android tablets ever made. In hardware terms it's the best you can buy right now, and the design is very thin and light. There is very little not to like here, and only the lower price of the Nexus 7 might sway you. ☒ **Chris Martin**

SMARTPHONE/TABLET

Samsung Galaxy Tab 4 8.0

£313 inc VAT

Contact
- samsung.com/uk

Read more
- tinyurl.com/pjabjnv

Specifications
Android 4.4.2 KitKat OS; 8in IPS WXGA (1280x800) screen, 188ppi; quad-core processor 1.2GHz (Mali 400 MP4 GPU); 1.5GB memory, 16GB built-in storage (10GB available); 2G/3G/4G LTE, 802.11n Wi-Fi, Bluetooth 4.0 (with aptX), ANT+; 1.2Mp front-facing camera, 3Mp rear camera, 720p video recording; mono rear-facing speaker; Micro-USB, 3.5mm mini-jack, microSD card reader up to 64GB, Micro SIM card tray; 4450mAh battery; 124x210x8mm, 320g (326g 4G model)

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

★★★☆☆

The Galaxy Tab 4 8.0 has an 8in screen and a SIM card slot for 4G (and 3G) data as well as Wi-Fi. It's also a phone, so you can use it as a massively oversized smartphone.

It's available in black or white, with or without the SIM card slot, and sits alongside 7in and 10.1in versions of the Tab 4.

The device aimed at the more price-conscious end of the market than the iPad-rivalling Tab S series. It lacks the S-Pen of the Galaxy Note models, too.

Since you can still buy the Galaxy Tab 3 8.0, this adds more models to the mix and even more confusion since when they're basically the same specs.

What differs is the design. The Tab 4 doesn't have a faux-metal band around the edge, but a thin chrome-like bezel with smaller rounded corners.

The rear camera is central instead of in the top-left corner, but there's still no LED flash. There's still a single rear-facing speaker but the Micro-USB port is now on the bottom edge, not the side.

On the right are the power and volume buttons. Below are two pop-out covers: one for the micro SIM card and one for a microSD card (up to 64GB is supported).

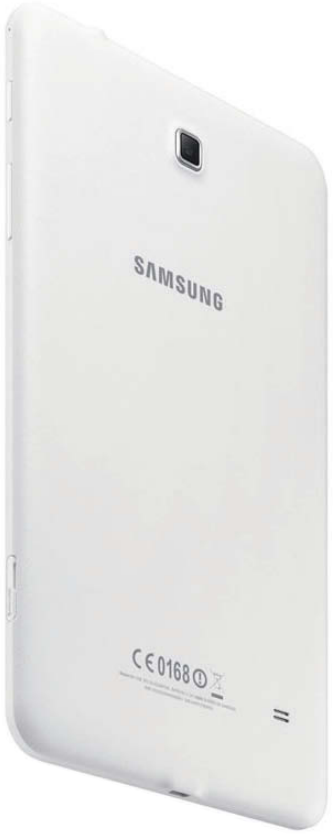
Either side of the physical home button are two touch-sensitive controls. They don't light up, so you can't find them in the dark, and are a pain when the tablet is held in landscape mode – it's all too easy for a wayward thumb to press one.

There's no metal in the casing so although build quality is good, the Tab 4 lacks a premium finish.

The relatively low resolution of 1280x800 makes for a very low density of 188ppi, so text look fuzzier than on high-res screens. Some people may not find this an issue, but it could be a disappointment for others.

At least the panel is decent quality – it appears to be the same screen used in the Tab 3. Colours are vivid and viewing angles and contrast are good. It's nice and bright but, like all glossy touchscreens, too reflective to be much use outdoors in bright light.

One of the main differences is the processor. The older model had



a dual-core 1.5GHz chip, but the new one has a 1.2GHz quad-core CPU. You can immediately tell the Tab 4 is a low-powered device by swiping between home screens. It's fast enough for basic tasks such as email and web browsing, and running two apps on screen at the same time.

The change of processor also means a change of GPU, from an Adreno 305 to a Mali 400 MP4. It's a step backwards, and the benchmark results speak for themselves. In GFXBench, it managed only 3.5fps in the Manhattan test and failed to get much above 10fps in the T-Rex. Although you'll still be able to play the latest games, the graphics quality is pared back to maintain smooth frame rates.

The Tab 4 8.0 has a GPS receiver, Bluetooth 4 (with aptX support), 802.11n Wi-Fi, support for Wi-Fi direct and also ANT+ – used on sensors such as heart-rate monitors and bike speed/cadence counters. Most people won't notice or care about ANT+ support, but might miss the IR blaster usually found on Samsung tablets.

One feature worth noting is the ability to run two apps on screen at once. You can use split-screen in landscape too, and it's easy to adjust how much space to give each app by dragging the dividing line.

Other features include SideSync 3 – handy if you also own a Galaxy smartphone. Similarly, you can mirror your tablet's screen wirelessly onto a compatible Samsung HDTV using the Link app.

You'll find the usual collection of Google apps including the Play Store as well as Samsung's own app store.

Oddly, the main camera still has just a 3Mp sensor, and the front-facing webcam a 1.3Mp sensor.

The back camera shoots only 720p video, and has no stabilisation at all. Both photos and video are dismal but are usable if you're desperate. As well as lack of detail, the poor-quality lens means parts of the image can be in focus while other are blurry.

One other thing to be aware of is that the lens isn't particularly wide-angle, so you can't fit as much in as you might expect. Switch to video mode and the image is even more zoomed in.

Verdict

Even though the Tab 4 8.0 is cheaper than the Tab S and Tab Pro tablets, it's expensive compared to its rivals. ☒ **Jim Martin**

SMARTPHONE

Apple iPhone 6

£539 (16GB)
£619 (64GB)
£699 (128GB)

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■ tinyurl.com/Lnkvjkk

Specifications
4.7in LED-backlit (1334x750, 326ppi) IPS display; 1400:1 contrast ratio (typical); 500cd/m² max brightness (typical); Full sRGB standard; A8 chip with 64-bit architecture; M8 motion co-processor; 8Mp iSight camera; 1080 HD video recording; 1.2Mp FaceTime camera; GSM/EDGE; UMTS/HSPA+; DC-HSDPA; CDMA EV-DO Rev A and Rev B (CDMA models only); 4G LTE3; 802.11a/b/g/n/ac Wi-Fi; Bluetooth 4.0; NFC; GPS and GLONASS; lithium-ion battery; 138.1x67x6.9mm; 129g

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

★★★★☆

Apple unveiled the iPhone 6 on 9 September 2014. With a 4.7in display, new design, improved specs and extra features, it is bigger and better than ever.

Price

The price will start at £539 – £10 lower than the starting price of the iPhone 5s was last year. That's still pricey for a smartphone, though, and is much higher than many of its Android and Windows Phone rivals.

If you want more than 16GB capacity, you'll need to cough up £619 for the 64GB model or £699 for the 128GB model. There's no 32GB model this time.

Design

With the increasing popularity of larger smartphones, it seems that the iPhone 6 and the even bigger iPhone 6 Plus are a reply to that success. Both models will undoubtedly help Apple reach audiences that weren't being served by its 4in iPhones, but it comes at the risk of losing customers who prefer that smaller screen.

One glance at the iPhone 6 and you'll see that it is noticeably larger than the iPhone 5s, with a 4.7in screen rather a 4in display. Pick it up and you'll find that it's a lot different to Apple's previous iPhones, with rounded edges more like those found on the iPod touch and iPad. It also brings to mind the original iPhone, with its curved edges and all-metal back.

Without making that softening design change, the iPhone 6 would be monstrous. It is slightly heavier than the iPhone 5s, but thin at 6.9mm and surprisingly easy to hold in your hand. Even the display's edges are slightly curved.

The iPhone 6's build quality is excellent. Some of the buttons and switches have been moved or redesigned, but they're still firm and responsive. The iPhone 5s's round volume buttons have been replaced with long metal ovals set into a slightly recessed indent.

The sleep/wake button has been moved to the right side from the top, which will take some getting used to for anyone already using one of Apple's older iPhones. The relocation makes it easier to hit the button without adjusting your grip or using your other hand. Apple is still keen on its one-handed-use motto for the iPhone, though, despite the bigger screen sizes, and it's doing everything it can to make you believe it.

There's even a Reachability feature to deal with the bigger screen with one hand. A double-tap on the Home button slides down the entire interface to about a third of the screen, so you access it quickly without straining. The interface is fully functional – you can even tap the status bar to jump back to the top of a web page, for example.

Although the feature makes sense, it's not very elegant. Snell says he began using Reachability without thinking after just a few days with the iPhone 6. "I did find it a bit inconsistent," he says. "The home screen doesn't slide all the way down, for instance. It scrolls the main icons down, leaving the dock and top bar where they were. No other app interacts with Reachability in this way."

Apple didn't quite manage to squeeze in the rear-facing iSight camera when slimming down the iPhone 6. The lens protrudes slightly from the back and it's definitely noticeable. You can still place the iPhone flat on its back, but it doesn't quite sit evenly.

Display

The 4.7in display has a resolution of 1334x750 pixels, which means the same 326ppi pixel density as the iPhone 5s. Apple has dubbed the new screen 'Retina HD'.

It's a bit disappointing compared with the 400ppi-plus displays of some rivals. Apple has made the iPhone 6 Plus 401ppi, so you'll have to buy the 5.5in iPhone if you want that better screen.

Thanks to scaling, iOS apps will still work on the iPhone 6 even if they haven't been updated for the larger display. If you look closely you might notice the difference, but the apps will still work in the same way.

For those who struggle with the size of the text on the iPhone 6's bigger screen, Apple has introduced

Display Zoom, which emulates the display of a smaller phone but scales it up to fill the iPhone's screen.

But turning on Display Zoom means missing out on some of the tweaks for the bigger screen. There are new columns of buttons on the iOS keyboard in landscape orientation, including an undo button and a comma on the left, and cursor keys and a full stop on the right. With iOS 8 comes support for third-party keyboards and an optional QuickType suggestion bar.

Specifications

Inside the iPhone 6 is Apple's new 64-bit A8 processor. As Apple continues to improve its processor it's becoming increasingly difficult to match the percentage increase in speed each year. Apple has managed to make the A8 even faster than the already speedy A7, but it's a more modest improvement than the jump from the A6 to the A7.

The A8 processor is 13 percent smaller than the A7, though. Designed to be 50 percent more power-efficient, it should also have slightly better battery life.

The A8 processor in the iPhone 6 runs at 1.2GHz, according to GeekBench, which is similar to the A7. The iPhone 6 Plus, on the other hand, has a clock speed of 1.39GHz. Both iPhone 6 models appear to have the same 1GB of memory as older iPhones.

GeekBench tests of the iPhone 6 gave it a single-core score of 1517 – higher (and therefore better) than the 1409 of the iPhone 5s. In the multi-core test, the iPhone 6 achieved 2586 compared with 2549 of the iPhone 5s.

A new version of the M7 co-processor arrives with the iPhone 6, too. It's called the M8 and works with the iPhone 6 to determine when you're walking, cycling and running. It can also estimate distance and elevation, so it'll know when you're running up the stairs, for example.

All the sensors, including the new barometer sensor and the Touch ID fingerprint sensor, will be available to third-party iOS developers.

In terms of connectivity, the iPhone 6 has better LTE capabilities, as well as NFC for the first time, which will work together with the new Apple Pay mobile payment service. Apple Pay won't be available until October and even then only in the US. It's expected to arrive in Europe next year.

It's also worth noting that Apple has confirmed that NFC will not yet be opened up to third-parties so will work only with Apple Pay to begin with. We expect Apple will wait until the next generation of iPhone or beyond to open the tech up to developers.

Camera

The camera has been improved in the iPhone 6, though you might not realise it if you simply look at the specs. The rear camera is still 8Mp, it still has a True Tone dual-LED flash, its aperture is still f/2.2 and the pixels are still bigger, at 1.5 microns.

Apple says the camera sensor is all-new, though, and that autofocus, advanced face detection and digital image stabilisation features should result in improved photographs.

Apple has added dedicated 'focus pixels' to the camera for speedier and better autofocus for both photos and video. The main area of improvement in use was the video autofocus, which was clear and smooth instead of robotic and jarring as with previous iPhones.

There's also an even slower slo-mo feature that can shoot at 240 frames per second. So when you're running that clip at one-eighth of the speed of normal video you'll get some impressive slow motion results, improved even more by the enhanced video stabilisation.

The front-facing FaceTime HD camera has a new sensor, an improved aperture and better low-light photographs. It's also able to use the Burst mode and HDR.

Software

The iPhone 6 runs the brand-new iOS 8. For more details about this turn to page 66.

Verdict

It's clear that the most important change with the iPhone 6 is its size. Yes, the processor is a bit faster and the camera is slightly improved, but it's the 4.7in display that makes the biggest difference. It means a better experience when watching TV or movies on your iPhone, it displays photos better, and it allows more information to be shown on the screen at the same time.

If you've got an iPhone 5 or older, then the iPhone 6 is a solid upgrade that you'll get used to after just a few days of adjustment. However, iPhone 5s owners might want to seriously consider waiting another year for the iPhone 6s to arrive as they've already got a brilliant smartphone and aside from that bigger display, the iPhone 6 doesn't bring many new features to the table.

As with the iPhone 6 Plus, we'll hold off our final verdict and star rating until we've been able to test its battery life. ☒ **Ashleigh Allsopp**

PHABLET

Apple iPhone 6 Plus

£619 (16GB)
£699 (64GB)
£789 (128GB)

Contact
■ apple.com/uk
Read more
■ tinyurl.com/o9rx9un

Specifications
5.5in LED-backlit (1920x1080, 326ppi) IPS display; 1300:1 contrast ratio (typical); 500cd/m² max brightness (typical); Full sRGB standard; A8 chip with 64-bit architecture; M8 motion co-processor; 8Mp iSight camera; 1080 HD video recording; 1.2Mp FaceTime camera; GSM/EDGE; UMTS/HSPA+; DC-HSDPA; CDMA EV-DO Rev A and Rev B (CMDA models only); 4G LTE3; 802.11a/b/g/n/ac Wi-Fi; Bluetooth 4.0; NFC; GPS and GLONASS; lithium-ion battery; 158.1x77.8x7.1mm; 172g

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

★★★★☆

Apple's iPhone 6 Plus is big, really big – a gargantuan 5.5in diagonally across its screen. It's the biggest iPhone so far, but does that outweigh the negatives: loss of portability, greater power requirements and the difficulty of one-handed use?

The main difference between the two new iPhones is size – the Plus is 14 percent wider than the iPhone 6 – although iPhone 6 Plus also has more advanced camera technology.

Size aside, the new iPhones share a design that sets them apart from last year's iPhone 5s and iPhone 5c. They are both narrower, and more curvy, with rounded edges rather than the straight sides of the 5s.

Oddly enough, the iPhone 6 Plus brings to mind the original iPhone, with its curved aluminium edges and all-metal back. Even the glass screen has a slight curve at the edges, which feels pleasant against your hand in a way that the sharp edges of the iPhone 4 and 5 series (iPhone 5c excluded) never quite did.

Apple must have needed to slim down the iPhone 6 Plus as much as possible, because had the edge been 7.6mm rather than 7.1mm that would have been a lot of extra bulk to cart around. It would have added to the weight and sat less comfortably in your hand – stretching your palm half a centimetre further to reach the screen definitely matters if you have small hands.

Other hardware design changes include the volume buttons being oval rather than round and the sleep/wake button on the right instead of on the top, presumably to make it easier to reach one-handed.

Build quality is excellent. Buttons and switches are uniformly firm and responsive, and the ring/silent switch produces a satisfying click. One small concern is the rear-facing camera: a casualty of the ever shrinking depth of the iPhone's chassis, it sticks out slightly, marginally spoiling the integrity of the iPhone profile. Laying the iPhone 6 Plus down on a hard, flat surface may cause it to sit unevenly.

Colour options are the same as for the iPhone 5s.

Reachability

Conscious that some smartphone buyers have said that 5.5in screens are too large to use one-handed, Apple has given the iPhone 6 Plus a Reachability feature. This is Apple's solution for not being able to reach the far corners of the screen if you use the iPhone 6 Plus one-handed.

You activate Reachability by tapping (not pushing) the home button twice. When activated, Reachability slides the top of the screen down to where your thumb can reach it. Another double-tap returns everything to normal.

Reachability isn't particularly elegant but it is a solution and it makes the larger screen more usable. In our testing there was some inconsistency in how Reachability was implemented.

Apple is referring to the display on both the iPhone 6 and 6 Plus as Retina HD. This may be pushing the truth with the iPhone 6, which has exactly the same number of pixels per inch (326) as the iPhone 5, 5c and 5s – they aren't packed in any closer together.

The iPhone 6 Plus, on the other hand, offers 401ppi – that's the highest resolution on an Apple iOS device and it's the same as a full 1080p display, which is what your high-definition TV offers.

Mind you, when Apple first introduced Retina display it said that the eye was unable to see any more pixels, so maybe it doesn't really make a difference. Except it does, as you can tell from looking at Android phones with more pixels.

Upping the screen resolution beyond standard Retina may not seem worth the expense, since many experts have claimed that the human eye can't discern greater detail than Retina at standard smartphone distance. But initial impressions with the iPhone 6 Plus were, well, great. Every app looked stunning on the 401ppi screen.

Apple says it offers wider viewing angles because of its dual-domain pixels. We certainly felt the most impressive aspect of the screen was the wide viewing angle and the extra clarity when compared to the iPhone 5s. When placed flat on the desk and viewed from the side we could see the colours and clearly make out

the app icons. We also felt that the screen was a lot less reflective than that of the 5s, although being bigger meant that there was a lot more screen for reflections.

In order to make the most of the more detailed display Apple is using scaling techniques, so that more detail can fit on to the screen, including extra keys on the keyboard

Apple has also added a feature called Display Zoom, so you could choose to view the screen like you would on a smaller iPhone, only zoomed in.

Camera

Another particularly noticeable change is to the camera – not just new photography features but the fact that the lens protrudes in a way that seems very un-Apple. So un-Apple, in fact, that the company has gone to great lengths to ensure the unsightly bump doesn't show up in its promotional photography.

The camera lens is surrounded by a thin metal ring. Reportedly, this was a trade-off made necessary by the iPhone being too thin for the camera mechanics. It may be preferable than the whole device being a few millimetres thicker, but if this is the reason it seems strange that both iPhones have the same protrusion. Surely the slightly thicker 6 Plus could have concealed more of the bulge?

The iPhone 6 Plus and the 6 share new camera features, but the larger device has some more that its smaller sibling lacks. For example, the 6 Plus has optical image stabilisation while the 6 offers only digital image stabilisation. Plus, the lens on the iPhone 6 Plus can move up and down, and side to side, to adjust and stabilise images. Apple claims that this works well in low-light conditions.

Both iPhones offer 'focus pixels' for faster autofocus. This comes in useful when shooting video as these pixels automatically focus continuously as you are shooting.

In use, the focus behaviour in video is particularly noticeable – after all, video focus has never been really been one of the iPhone's strong suits. But the focus in videos we shot with the iPhone 6 and 6 Plus is clear and smooth, never seeming robotic or jarring. We also tested this feature out for photography and found there was no need to tap the screen to focus. Filming a figure and placing something in and out of the frame caused the camera to change its focus between whatever happened to be in the foreground and the figure. It happened quickly. Running the same comparison on the iPhone 5s, we found that the only way to get the camera to focus was to tap on the screen where we wanted the point of focus to be. It's an impressive feature. We intend to try it in low-light as this is where Apple says it has the greatest effect.

There's also improved face detection on both the front- and back-facing cameras, panorama shooting at up to 43Mp, 1080p HD video recording at 30fps or 60fps (previously it was only 30fps), cinematic video stabilisation, and continuous autofocus video.

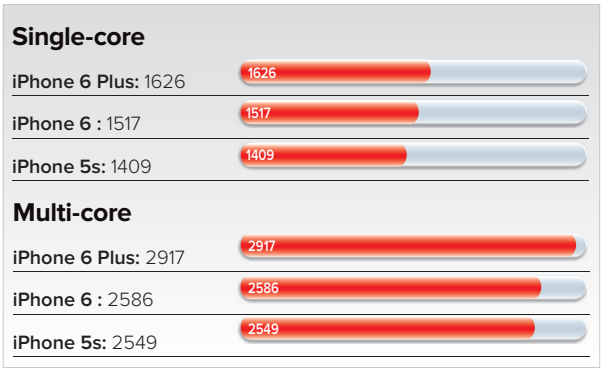
The front-facing FaceTime camera contains a new sensor with a larger f/2.2 aperture that lets in 81 percent more light. It's perfect for low-light selfies and video calls and compares favourably with the f/2.4 aperture on the iPhone 5s. There's also auto HDR for photos and videos on the FaceTime camera (previously it was only photos), and a Burst mode on the FaceTime camera.

A8 processor

Both the iPhone 6 and 6 Plus are powered by the new Apple A8 processor, although it runs at different clock speeds. The iPhone 6 Plus is clocked at 1.39GHz compared with the iPhone 6's 1.2GHz. We ran the Geekbench single- and multi-core tests on the new iPhones. The results are shown in the table above.

We also ran graphics tests via GFX Bench. The Manhattan test brought up 33.4fps for the iPhone 6 Plus compared to 27fps for the 5s. The 1080p Manhattan test (run off screen) delivered 18.6fps for the 6 Plus and 12.7fps for the 5s. The T-Rex text saw 52.1fps for the 6 Plus and 44.8fps for the 5s and, when run at 1080p, 40.2fps for the 6 Plus, and 26.37fps for the 5s.

Another way in which the new chip might make a difference is in power efficiency. The A8 uses a different manufacturing process that makes it more power-efficient, and that may have an impact on battery life.



M8 processor

The Motion co-processor also gets an update. The M8 replaces the M7 used in the iPhone 5s. This chip is used to collect sensor data – it's a clever way to save battery life as it bypasses the A8 (or A7) processor.

The M8 also collects data from the new barometer sensor used to measure elevation changes so it can tell if you have been climbing steps and presumably gauge your fitness levels from that.

Battery life

Battery life has improved because the case can take a bigger battery. Apple claims that the iPhone 6 Plus battery life allows up to 24 hours of talk time on 3G, up to 16 days/384 hours of standby time, up to 12 hours of internet on 3G, up to 12 hours on LTE, up to 11 hours on Wi-Fi, up to 14 hours of video playback, and up to 80 hours of audio playback. That all sounds pretty impressive, though, we haven't been able to test this yet.

Software

As with the iPhone 6, the 6 Plus comes with iOS 8. Turn to page 64 for our full review of iOS 8.

Verdict

The iPhone 6 Plus is a stunning piece of design, and its sumptuous screen will be a magnificent showpiece for the latest games, movies and web pages. Whether the Reachability feature will be enough to solve the problems of such a large smartphone remain to be seen, though. ☒ **Karen Haslam**

SMARTPHONE

Motorola Moto G

£149 inc VAT

Contact
- motorola.co.uk

Read more
- tinyurl.com/kcb7c5n

Specifications
Android 4.4 KitKat OS; 5in display (720x1280, 294ppi); 1.2GHz quad-core Qualcomm Snapdragon 400 CPU; Adreno 305 GPU; 1GB RAM; 8/16GB internal storage; 8Mp rear camera with LED flash; 2Mp front camera; video recording at up to 720p; 802.11b/g/n; Bluetooth 4.0 LE; A-GPS; non-removable battery; 71x142x11mm; 149g

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

★★★★½

PC ADVISOR RECOMMENDED

No sooner had Motorola updated the original Moto G with 4G and a microSD card, there's another update: the Moto G. That's right – a completely new smartphone with the same name. Very confusing.

The second-generation Moto G is easier to find online by searching for its part code: XT1068. Visually, though, the 2014 model is easy to tell apart from the original (and revised 4G version) thanks to the prominent front-facing speakers and larger 5in screen.

The new Moto G costs from £149 for the 8GB version, which is all you'll be able to buy in the UK. Motorola is now selling the smartphone directly from its website, and it isn't much more expensive than the revised 4G Moto G, which you can pick up (in 8GB format) for £130. We're sure that discounts will be available soon from other retailers.

Design and build

The new Moto G addresses feedback Motorola received from the original and has a bigger screen, better speakers and dual-SIM card slots. Unfortunately, support for 4G has been dropped, so this phone is limited to 3G.

Design-wise, the new Moto G follows the original almost exactly. There's no metal and no disguising the plastic finish: it feels cheap compared to the plastic iPhone 5c. However, let's not forget the massive difference in price between those two smartphones.

Buttons and ports are in the same places, and the rear cover is removable to reveal both SIM slots and the microSD slot (which will accept cards up to 32GB).

It's bigger than its predecessor in width and height, but not in depth – it remains the same at roughly 11mm. Weight is practically the same, too, at a shade under 150g. The handset is well balanced and feels lighter than you'd expect.

There are two colours, black and white, and you can buy coloured rear shells for £10 in the following colours: Chalk, Black, Violet, Spearmint, Raspberry, Royal Blue, Turquoise and Lemon Lime.

Flip shells have a magnetic front cover, which turn on and off the Moto G when opened and closed it. These cost £22 and come in Chalk, Black, Royal Blue, Turquoise, Lemon Lime and Cherry.

The smartphone isn't much bigger overall, but the 5in IPS display feels like a nice upgrade over the 4.5in of the original. Even so, it's a bit disappointing that the resolution is still 1280x720, meaning a drop in pixel density to 294ppi (compared to 329ppi).

It's still a great screen, though, with vivid colours and great viewing angles. Brightness is decent enough, if not the brightest around.

Performance

Oddly, Motorola hasn't upgraded the processor. The Snapdragon 400 quad-core chip runs at 1.2GHz and has the Adreno 305 graphics processor. That means performance is the same – which is to say very good, especially at this low price.

In Geekbench 3 we saw an average score of 340- (single-core) and 1144 (multi-core) points. These scores are on par identical with those of the original Moto G: 334- and 1168 points respectively.

In GFXBench 3 the Moto G returned 11fps in the T-Rex test – exactly the same as the old model, so no surprises there.

Web browsing performance is measured using SunSpider 1.0.2, in which the new Moto G managed an average of 1526ms, marginally slower than the original's 1504ms.

In other territories the new Moto G will also be available in a 16GB version, and both this model and the 8GB version have dual-SIM slots. The bad news is that 4G is not supported. If you need faster mobile internet, you'll have to either go for the revised first-generation Moto G or look elsewhere.

The handset has the basic specs you'd expect: 802.11n Wi-Fi, Bluetooth 4.0 and GPS. Note that the Wi-Fi is at least dual-band, so will work with dual-band routers that support 5- as well as 2.4GHz.

Compared to the single rear-facing speaker of the original Moto G, the new front-facing

speakers are superb. There's no need to turn up the volume so much since the audio is directed straight at your ears.

They're not great for music, but when playing games and watching videos on YouTube or iPlayer, you'll really appreciate both the stereo separation and the decent quality.

Cameras

The mediocre cameras have been upgraded, with an 8Mp sensor at the rear and 2Mp at the front. As before there's an LED flash at the back.

Video is still captured at only 720p, which is strange as 8Mp is more than enough for 1080p.

We found still image quality much better than video. (You can check out the quality in some of our test shots below.)

One slight disappointment is that the images from our test Moto G weren't sharp to the edges of the frame. For the most part you won't notice this, but it's easy to spot when you zoom in on photos.

Instead of using Google's own Camera app you get Motorola's. This is easy to use and includes Panorama and HDR modes. You can tap to focus, and tap and hold to take photos in burst mode.

The HDR mode can be set to auto, on or off. This can make a huge difference in the right circumstances.

It's worth bearing in mind that the app defaults to 16:9 photos, which crops the top and bottom and uses only 6Mp of the sensor's resolution. If you want the full 8Mp switch to 4:3 mode, which returns those top and bottom sections.

Video lacks detail even considering the 720p limit. It's not as jerky as some smartphones we've tested recently, but there's no optical stabilisation either.

Audio is recorded in stereo and is usable enough. If you want to have a bit of fun, there's a slo-mo video mode that also records in 720p. It's best to hold the phone still rather than moving it about in this mode if you want to avoid getting jerky footage.

Software

One of the benefits of buying a Motorola smartphone is that in essence you get plain Android, with nothing in the way of manufacturer-implemented overlays and customisations. Motorola has also guaranteed an upgrade to the new Android L mobile OS when it launches later this year, but for now the Moto G ships with KitKat 4.4.4.

It's worth noting that there are no hardware- or touch-sensitive buttons – the usual Android trio are found onscreen, and in some apps such as the Camera you have to swipe to display them.

You do get Motorola's useful Migrate app, which helps transfer all your stuff from an old Android smartphone or an iPhone. Plus there's Motorola Assist app, which can automatically detect when you're driving and read out incoming text messages. Using Google Now you can even dictate a reply without touching the phone.

Assist also has a sleep mode, which silences the phone between 'quiet hours' that you set, a Meeting mode that uses your calendar to work out when to keep quiet, and a 'Home' mode that will read out text messages so you don't have to pick up the phone.

If you're considering the new Motorola Moto G for its dual-SIM slots, bear in mind that the old model was also available with two slots – if you can find one.

The benefit of this new version is that it's very easy to switch between SIMs, and an Intelligent Calling feature will learn which numbers you call from each SIM and automatically switch to the appropriate SIM. You can manually select the SIM to use, but pop-ups will offer messages such as "You called this number on the other SIM last time. Do you want to switch?".

The Moto G's battery life is pretty good. With light use it lasted exactly two days before demanding a recharge. That light use involved around an hour of watching YouTube, an hour of web browsing, several phone calls and some emails.

Verdict

With a bigger screen, much better speakers and improved cameras, the new Moto G is a great budget smartphone. The lack of support for 4G will be a deal-breaker for some, though. It isn't without its rivals, but if you're specifically looking for a budget dual-SIM Android phone, it's a good choice. ☒ **Jim Martin**

SMARTPHONE

HTC Desire 610

£239 inc VAT

Contact
- htc.com/uk

Read more
- tinyurl.com/ov443j5

Specifications
Android 4.4 KitKat with HTC Sense 6.0; 4.7in (234ppi) qHD display; 1.2GHz Qualcomm Snapdragon 400 processor; 1GB RAM; 8GB internal storage; 128GB microSD card slot; 8Mp rear camera with LED flash; 1.3Mp front-facing camera; video recording up 1080p; Wi-Fi 802.11ac; Bluetooth 4.0; NFC; 2040mAh non-removable battery; 143.1x70.5x9.6mm; 143.5g

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

★★★½☆

The HTC Desire 610 is HTC's latest mid-range smartphone, a cheaper sibling to the flagship HTC One M8 and successor to the HTC Desire 601. With a 4.7in display, a nice design, front-facing speakers and a good camera it's got a lot going for it, but it falls down when it comes to the display and processing power.

Design and build

The first thing we noticed about the Desire 610 is that it's very, very bright. HTC says it's "crafted to please your eyes", but we're not so keen on the Coral sample sent to us for review. The Navy Blue and White options are much nicer.

Elsewhere the design is good. Despite its plastic casing, the Desire avoids looking tacky or cheap. A matte coating around the edges and on the front is nice, but we wish HTC had extended this to the glossy rear.

The bezels are rather large, making this phone's dimensions much bigger than its 4.7in display might suggest. It's also relatively chunky at 9.6mm, although it doesn't feel fat. And at 143.5g prolonged use is comfortable.

The Desire 610 is a solid and well built smartphone, with nicely finished buttons and a discreet flap covering the SIM and microSD slots.

Hardware and performance

A 4.7in display is of a useful size, but its resolution is limited to just 540x960, with a pixel density of 234ppi. At this price that's not unusual, but it's disappointing given that the HTC's front-facing speakers would otherwise have made the Desire 610 a great device on which to watch movies and play games.

HTC has fitted the same 1.2GHz Qualcomm Snapdragon 400 processor as is found in the Motorola Moto G (page 44), which it couples with 1GB of RAM. Performance is sufficient, but given the £90 price difference between these two handsets we might have expected a little more.

The HTC fared reasonably well in our benchmarks, averaging 1224ms in SunSpider and 1161 points in Geekbench 3 (multicore). It also managed 15fps in GFXBench 3.0's T-Rex test. These results put it on par with the cheaper Moto G.

You'll find launching apps on the HTC Desire 610 smooth and quick, and we didn't notice any lag while navigating the device or launching apps.

There's 8GB of built-in storage, which can be expanded via microSD (up to 128GB).

Connectivity includes 4G LTE and 3G, as well as NFC, Bluetooth 4.0 and 802.11ac Wi-Fi. It's not surprising to see a lack of additional features such as an IR blaster at this price.

An 8Mp rear-facing camera has an aperture of f/2.4 and an LED flash; it can also capture 1080p video. We were pleased with its results.

Meanwhile, the front-facing camera is 1.3Mp and can capture 720p video.

A wide range of filters and effects are found in the Camera app, including HDR, vignette, depth of field, vintage and greyscale.

When looking back over your photos you'll find a gimmicky but fun video slideshow playing at the top of the screen in the Gallery app. HTC's Zoe app offers an expanded version of these video slideshows, enabling you to share them with friends.

The HTC Desire 610 runs Android 4.4 KitKat with HTC Sense 6.0. It's a marked departure from standard Android, but features a clean design, a simple navigation system, easy-to-access settings and some extras, including the aforementioned HTC Zoe and the BlinkFeed social media- and news aggregator. (You can remove BlinkFeed if it's not your cup of tea.)

You'll also get HTC Sync Manager, which is particularly helpful for anyone switching from an iPhone or another Android phone, and offers a quick and easy way to get your files including music and photos on and off the Desire 610.

HTC Connect is also supported, letting you easily connect to your home-entertainment system to play audio and video from the Desire 610. It's a bit like Apple's AirPlay system.

HTC says that the 2040mAh non-removable battery will last up to 15.8 hours of talk time or up to 650 hours on standby. We found the 610 managed up to two days of general use without charging, but if you spend much of your time watching video and playing games you will likely find your mileage will vary.

Pleasingly, HTC also offers a power saving mode and an extreme power saving mode for when the battery level becomes critical.

Verdict

The HTC Desire 610 will appeal to anyone looking for a reasonably priced and good all-round smartphone. Its HTC Sense software is sleek and easy to use, and you'll be satisfied with the battery life. We really enjoyed our time with the HTC Desire 610 and have few qualms other than the large bezels and slightly disappointing display.

But while the HTC Desire 610 is a very good phone when considered on its own, bring into the picture the Nexus 5 and Motorola Moto G and it becomes difficult to recommend. The latter offers a £90 saving and very few sacrifices, while Google's handset costs an extra £60 but has a faster processor, a better display and more. ☒ **Ashleigh Allsopp**

PHABLET

HTC Desire 816

£289 inc VAT

Contact
■ htc.com/uk
Read more
■ tinyurl.com/my8v6e8

Specifications
Android 4.4 KitKat with HTC Sense 6.0; 5.5in (1280x720, 267ppi) display; 1.6GHz Qualcomm Snapdragon 400 processor; 1.5GB RAM; 8GB internal storage (5.86GB available); 128GB microSD card slot; 13Mp rear camera with LED flash; 5Mp front-facing camera; video recording up 1080p; Wi-Fi 802.11n (2.4GHz); Bluetooth 4.0 with aptX; 2,600mAh non-removable battery; 156x78x7.9mm; 165g

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

★★★½☆

Not everyone wants to shell out for a flagship smartphone, but you may not want to buy the cheapest smartphone going either. HTC is aiming the new Desire 816 squarely at the mid-range buyer, and it looks like it's got the formula just about perfect.

Perfect, that is, if you're looking for a large-screen smartphone: the 816 has a 5.5in panel that makes this feel huge if you're upgrading from a 4- to 4.5in phone. It has to compete with other mid-range Android smartphones such as the Nexus 5 and more recent OnePlus One, which also has a 5.5in screen.

Design and build

The 816 is available in a Nokia-like selection of hues, but we prefer the white model we were sent for review. The casing is all plastic – no surprises there – with a glossy non-removable rear panel and matte-finish sides and front.

Volume and power buttons are at the top of the lefthand side, slightly unusual but easy to get used to, and there's a headphone socket on top. The Micro-USB port is on the bottom, and a pop-out panel on the righthand side hides the nano-SIM and microSD slots.

Build quality is very good, if not up to the level of the much more expensive iPhone 5c or the cheaper OnePlus One.

One of the compromises made to keep down the price is the 720p resolution. This works out at 267ppi – a far cry from the 401ppi of the OnePlus One and 445ppi of the Nexus 5.

It's still an IPS panel, though, which means the resolution is the only weakness. Colours and contrast are strong, and it's great for watching videos, which look sharp enough.

If you prefer to use built-in speakers rather than headphones, the Desire has the advantage of HTC's BoomSound stereo speakers. These sit either side of the screen. They're not outstanding, but a clear step above smartphones with a single rear-facing speaker, such as the Lumia 1320. They're ideal for catch-up TV, YouTube and games.

Hardware

There's another compromise: processing power. The 816 has a Snapdragon 400 processor: four cores running at 1.6GHz and backed by 1.5GB of RAM. It feels zippy enough in general use, but it's no match for the Nexus 5 or OnePlus One with their much speedier chips.

It's the same story for 3D graphics: the Desire could manage only 11fps in GFXBench's T-Rex test, but the other two phones deliver smooth 24fps-plus gameplay.

Our review model didn't have NFC (HTC says this is an optional feature), nor does the 816 benefit from 802.11ac Wi-Fi – it's limited to 802.11n, and 2.4GHz not 5GHz. There's GPS, though, and Bluetooth 4.0. A small bonus is that it supports aptX for better Bluetooth audio streaming if you have a compatible speaker system.

The microSD slot will accept cards up to 128GB, and you'll certainly want to add to the meagre 8GB of internal storage. Around 6GB of this is available out of the box.

The Desire 816 supports 4G, and we had no complaints about signal strength or call quality in our tests.

We also ran the smartphone through Geekbench 3 and SunSpider. In the former test the 816 managed 439 points in the single-core component, and 1503 points in the multi-core segment. In SunSpider it managed 940ms.

Keen photographers will probably be looking at the 816 because of its cameras. At the front is a 5Mp snapper that can also shoot 1080p video, and there's a 13Mp main camera with an LED flash at the back. It's the same arrangement as on the HTC One mini 2.

Video options include 720p and 1080p resolutions, but you can also switch to 60fps or slo-mo.

Video quality is reasonable, given the right conditions. It's fairly sharp and the stereo sound track helps improve the perception of quality. One big issue is that there's no stabilisation, so video footage is shaky. But, as with the One mini 2, there's too much compression for our liking, leading to a lack of detail.

With stills you'll get better results if you switch to HDR mode whenever there's high contrast in the scene, as the main camera doesn't deal with bright backlighting very well.

There's manual control over ISO and EV correction, plus a self timer, but not much else.

Photo quality is decent unless you zoom in and look at the actual pixels. Snaps are fine for small prints or sharing online but, unfortunately, this is not the best smartphone camera we've seen.

With a 2,600mAh battery, we found it necessary to enable the Power Saver mode to get the 816 through a full day. There's also an extreme power saving mode, which turns off practically everything (and dims the screen) to eke out an extra day of life when you're unable to charge your device.

Verdict

Like HTC's 610, the Desire 816 sits awkwardly between other smartphones in terms of price, with rivals including the OnePlus One, Nokia Lumia 1320 and Nexus 5. You won't be disappointed if you can find one around £200. ☒ **Jim Martin**

SMARTPHONE/TABLET

Sony Xperia T3

£245 inc VAT

Contact
- sony.co.uk

Read more
- tinyurl.com/pafkjp8

Specifications
Android 4.4.2 KitKat OS; 5.3in HD (720x1280, 277ppi) display; 1.4GHz Qualcomm Snapdragon 400 quad-core processor; 1GB RAM; 8GB internal storage; 32GB microSD card slot; 8Mp rear camera with LED flash; 1.1Mp front-facing camera; video recording up to 1080p; Wi-Fi 802.11a/b/g/n; Bluetooth 4.0 LE; NFC; 2500mAh non-removable battery; 151.1x77.5x7mm; 148g

Build:
Features:
Performance:
Value:

Sony's Xperia T3 is a mid-range phablet that you can pick up online for around £245. That makes it just a few pounds cheaper than Sony's other phablet, the 6.4in Z Ultra.

Design and build

The T3 follows the same square design Sony has adopted for its Xperia smartphones over the past few years. This slab has thick bezels, but an attractive stainless steel frame. Unlike premium Xperias, the rear is not made from glass, but has a soft-touch plastic cover. It's available in black, white and purple.

Also unlike other Xperias, this rear cover is contoured at the edge, allowing the T3 to sit better in the hand, although it's still difficult to use one-handed. Neither does it feature IP67-certified dust- and waterproof protection.

Sony claims the T3 is the thinnest 5.3in phone in the world. True, it's nicely svelte at just 7mm and 148g, although no other 5.3in phone springs to mind.

The build quality is reasonable, but nothing special. Despite the primarily plastic design, the steel frame makes the T3 reassuringly solid. But small flaws – clicky, wobbly buttons and those chunky bezels – signify its mid-range price. The recess for the ear piece also collects dust and dirt very easily.

Hardware and performance

The Xperia T3 delivers as expected for a mid-range smartphone. The 5.3in screen has only a 720p resolution, although benefits from Sony's Triluminos technology for good colour reproduction. It has a nice natural look and the IPS panel makes for great viewing angles.

There's also 8GB of storage, which Sony lets you boost via microSD (up to 32GB).

A middle-of-the-road Qualcomm Snapdragon 400 quad-core chip is clocked at 1.4GHz. Paired with 1GB of RAM it delivers smooth, if not outstanding, performance.

The Xperia T3 scored 1389 points in Geekbench 3, 11fps in GFXBench's T-Rex test and 1342ms in SunSpider.

Given the low-power processor and low-resolution screen, battery life is good. The non-removable 2500mAh battery should offer a couple of days of use, and with light usage you might even get three.

NFC and 4G are supported, but connectivity is otherwise fairly basic. You'll find 802.11a/b/g/n Wi-Fi, Bluetooth 4.0 LE and A-GPS, but no IR blaster.

As always, Sony delivers on the photography front. We were pleased to find the Exmor RS for mobile image sensor in the Xperia T3's 8Mp camera. A dedicated camera shutter button lets you launch the Camera app from any screen; you can then half-press it to focus, while a second press captures the scene.

Sony's Superior Auto Mode will suit most users and achieve decent results in most lighting conditions, but don't be scared to switch to manual mode. Here you'll find various shooting modes, the most useful of which is HDR.

Other camera modes include Creative effect, Timeshift burst, Sweep Panorama and AR effect. These are all fun or helpful, sometimes both, but we're not taken with the Portrait retouch option.

On the video front you can shoot in full-HD quality, and there's a 1.1Mp front-facing camera that can take decent selfies in good light. This is limited to 720p video recording.

Sony's software hasn't changed much over the past couple of years. The Xperia T3 comes with Android 4.4.2 KitKat and the now familiar Xperia user interface.

While we like the fact Sony's interface is clean, simple, stylish and easy to use, it doesn't really add any major features. It's pretty much stock Android with Sony styling, which means you get some decent wallpapers, widgets and a slightly different lock screen.

Sony preloads some additional apps. We like the Walkman, Album and Movies apps for browsing and accessing different media. Less attractive are those enticing you to buy content from the Sony Entertainment Network. You can just ignore these.

Other additions include OfficeSuite (handy for opening various documents) and Gamin Navigation, which sounds good but is only a 30-day trial.

Verdict

The Xperia T3 is a good but not great smartphone, which will suit those wanting a large screen smartphone without spending loads of cash. It delivers on this, but you should also consider the slightly smaller £299 Nexus 5 for improved performance and a better screen, or even Sony's own 6.4in Xperia Z Ultra. ☒ **Chris Martin**

SMARTPHONE

Samsung Galaxy S5 mini

£389 inc VAT

Contact
- samsung.com/uk

Read more
- tinyurl.com/pkrzph6

Specifications
1.4GHz Exynos 3 quad-core processor; Android 4.4 KitKat with TouchWiz UI; 1.5GB RAM; 16GB internal storage with microSD support up to 64GB; 5.5in (720x1080, 326ppi) Super AMOLED display; Mali 400 graphics; 4G LTE; dual-band 802.11a/b/g/n; Wi-Fi Direct; Bluetooth 4.0; NFC; fingerprint sensor; heart-rate sensor; IR blaster; 8Mp rear camera with autofocus and single-LED flash, supports full-HD video at 30fps; 2.1Mp front camera; GPS; 3.5mm headset jack; water- and dust-resistant; available in white, black, gold and blue; 2100mAh removable battery with Ultra Power Saving mode; 131.1x64.8x9.1mm; 120g

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

★★★½☆

Priced in line with its closest competition, the HTC One mini 2, the Samsung Galaxy S5 mini looks to be a good deal. But the tiny price gap between it and the standard S5 (£414 SIM-free) leads us to wonder why anyone might choose this smartphone over its full-spec sibling.

The most obvious difference between little and large is the screen. Not only is the mini's display smaller, at 4.5in versus 5.1in, it's also just 720p against the S5's 1020p.

The processor-, memory- and storage options have also been downgraded, and the Wi-Fi, main camera and battery capacity reveal yet more cutbacks.

Design and build

Despite these tweaks, in terms of design the S5 mini is exactly what its name implies: a smaller version of the Galaxy S5. It's available in the same colours – white, black, gold or blue – and has the same dimpled plastic rear cover. As with the S5 this cover is removable, giving access to an also-removable battery, plus SIM and microSD slots.

Unlike other phones with removable covers, the S5 mini won't flex or creak under pressure. And that's reassuring, given that Samsung claims this phone features IP67-rated dust- and waterproof protection. It doesn't have the same fiddly (annoying) Micro-USB cover flap as the standard S5.

Samsung has been heavily criticised for this rear panel, and we have to agree: it makes the S5 mini look much cheaper than it is. That's not to say this is a bad-looking phone, although it's got nothing on the all-metal HTC One mini 2.

A sleek slab with rounded edges, the S5 mini's design is identical to that of previous S-series handsets. You get a 3.5mm headset jack and IR blaster on top, power on the right side and a volume rocker on the left. At the front is a physical home button, which now includes a fingerprint sensor, plus two software buttons: Recent apps and Back. Turn it over and you'll find an 8Mp camera with single-LED flash, a speaker and a heart-rate sensor.

Its smaller dimensions make the mini a much better fit in the hand than the larger Galaxy S5, even if that does mean sound is muffled from the rear-facing speaker, while its extra width makes up for the reduced weight in securing a grip.

At 4.5in this phone's display is hardly tiny, but the 0.6in between S5 and S5 mini is noticeable.

Because Samsung uses a Super AMOLED panel, the S5 mini's 720p HD panel is much better-looking than most. Its colours are bright and vivid, and the phone's 326ppi pixel density is still up there in what Apple terms 'Retina' quality (indeed, it has the same pixel density as both the iPhone 5s and HTC One mini 2). Text is sharp and clear, and viewing angles are good.

Hardware and performance

With a 1.4GHz quad-core processor, 1.5GB of RAM and Mali 400 graphics, we weren't expecting mind-blowing performance from the mini.

In Geekbench 3 the Samsung Galaxy S5 mini recorded 372 points in the single-core test, and 1186 points in the multi-core component. That's only slightly faster than the HTC One mini 2's 1153 points.

In GFXBench the mini managed 9.5fps in the T-Rex test. That's sufficient for casual games, but it's a long way from the best we've seen.

Finally, in SunSpider, Samsung's tiny Galaxy recorded 1104ms, putting it slightly behind the older Samsung Galaxy S4 (1092ms), but ahead of the HTC One mini 2 (1504ms) and LG G2 mini (1698ms).

In terms of real-world use we found the Samsung Galaxy S5 mini fairly snappy. There is some lag when opening apps, but it's reasonable in day-to-day use.

The S5 mini comes with 16GB of onboard storage, of which 11.62GB is available. There's a microSD slot that lets you add 64GB, and you can also take advantage of Google Drive and third-party cloud-storage apps.

Like the S5 the mini is a 4G phone, but it doesn't feature Samsung's 4G- and Wi-Fi-pairing Download Booster. Neither does its dual-band Wi-Fi connectivity stretch to 802.11ac, and the mini doesn't support MHL or DLNA. Wi-Fi Direct, Wireless Hotspot, NFC, Bluetooth 4.0 and GPS are all present.

It's only 8Mp, but we were impressed with the S5 mini's rear camera. This is paired with a single-LED flash and autofocus, plus several filters and special-effect modes. There is an impressive amount of detail, with no evidence of blurring. Colours are realistic, too.

The rear camera is also capable of shooting full-HD video at 30fps, which is decent but down from the 4K video of its bigger brother.

Following on from the full-size S5, the S5 mini features a fingerprint scanner, built into the Home button. It can be used to unlock your device, verify your Samsung account or pay with PayPal. It also takes the S5's heart-rate sensor.

The S5 mini runs Android 4.4 KitKat out of the box, and will be upgraded to Android L. Samsung overlays its TouchWiz UI, which has seen a few tweaks, including a redesigned Settings menu with round, colourful icons, new quick-access buttons for S Finder and Quick Connect, and the ability to hide any preinstalled apps that are cluttering up your app tray.

The S5 mini's 2100mAh battery easily lasted a day in our tests, while an Ultra Power Saving Mode turns off non-essential features to squeeze out useful extra capacity.

Verdict

The S5 mini is a decent Android phone, but it struggles to justify its price. The dust- and waterproof casing is a nice touch, but the heart-rate monitor and fingerprint scanner are welcome but not essential additions. **Marie Brewis**

SMARTPHONE

Nokia Lumia 530

£60 inc VAT

Contact
- nokia.co.uk

Read more
- tinyurl.com/oaxpfks

Specifications
Windows Phone 8.1; Qualcomm Snapdragon 200 processor; 4in (480x854, 245ppi) TFT capacitive touchscreen; 512MB RAM; 4GB internal storage; microSD up to 128GB; 802.11b/g/n; Bluetooth 4.0; Micro-USB; 5Mp camera; 1430mAh lithium-ion battery; 119.7x62.3x11.7mm; 129g

Build:
Features:
Performance:
Value:

The Lumia 530 is an important phone for Nokia/Microsoft. It follows the hugely successful Nokia Lumia 520 – the first sub-£100 phone that was worth owning.

The Lumia 530 retails for just £60, and at that price it will fly off the shelves of every high-street phone store. But the sub-£100 smartphone market has become a key battleground for manufacturers, and even at £60 the Lumia needs to be good in order to compete.

Design and build

You'd never mistake a Lumia phone for anything other than, well, a Lumia phone. The detachable back is made of brightly coloured plastic, and is available in a variety of colours ranging through everything from lurid orange to a bright, powdery blue. Flick off the rigid plastic rear and you gain access to the battery and SIM slots. A removable battery is always a good thing, and we commend the Lumia line-up for sticking with this option.

That plastic back is curved, meaning that even though the Lumia 530 is noticeably thick and chunky, it is not uncomfortable in use. The Lumia 530 measures 120x62x12mm and weighs in at 129g. Thus it is neither particularly thin nor light for a phone with a display of this size, and it's not outrageously heavy. And on the plus side it feels solid and well put together.

Cut into the back cover are holes for the camera aperture and rear-facing speaker. Along the bottom is a USB charging and connector port, and at the top is a 3.5mm jack for your headphones. Rounding out the back and sides of the Lumia 530 are a volume rocker and an on/off button that doubles as the camera shutter switch in camera mode.

The front is a single black panel with a Nokia logo at the top. Here we find our first hints of the Lumia 530's price, with larger bezels than we would expect for a phone with a display of this size.

Which brings us on to the display. Let's talk tech, first. The Lumia 530 has a 4in display. It's a TFT capacitive touchscreen, boasting 16M colours. Critically, on that 4in screen we get a 480x854 resolution, making for a pixel density of 245ppi. The Lumia 530's display is toughened, and the touchscreen responsive. So far so reasonable.

And yet we hate the Lumia 530's display. Even though its pixel density is better than that of the Lumia 520, we can honestly say we found that phone's display more satisfying.

Even on budget phones display quality is rapidly improving, but the Lumia 530's looks dull. Washed out, even. We are used to Windows Phone 8's interface popping off the screen with bright colours and flashing transitions, but on the Lumia 530 it looks flat and bland. Text looks slightly blocky and blurry close up, and the Nokia does no justice to photos, movies or games.

Hardware and performance

We've yet to come across a Windows phone that doesn't perform at least well enough. Almost always they are snappy and responsive, zippy in use. The Lumia 530 certainly keeps up this tradition, without ever threatening the record books.

The Lumia 530 is built around a quad-core Qualcomm Snapdragon 200 processor running at 1.2GHz. It's paired with 512MB RAM and Adreno 302 graphics. In use we had no problems with lag and the Lumia 530 was perfectly perky.

Because the Lumia runs Windows Phone it is difficult to run comparative benchmarks such as Geekbench, but we did run the SunSpider JavaScript test. The Lumia scored a mediocre 1486ms.

You get only 4GB onboard storage – in theory. In practice this is reduced to just over 3.6GB, and on our virgin Lumia 530 we had only 1.21GB free to use. If you like to store music, video or photos you will need to expand that storage. You can do so using the SD card slot that will accept up to 128GB, and you can store things in OneDrive.

A single 5Mp camera is rear-facing, making the Lumia unsuitable for video calls. It's not the best smartphone camera we've tested, but that's exactly what you should expect at this price. It also captures 480p video at 30fps.

The Lumia 530 comes with a lithium-Ion 1430mAh battery rated for up to 13 hours of talk time, and we had no problem getting through a whole day of email, web browsing, social media and camera use.

Software

The Nokia Lumia 530 runs Windows Phone 8.1. You can expect any Windows Phone updates to be available to the Lumia 530 when they come out, too. If you haven't used Windows Phone before, you don't need to be afraid. It lacks the app support of Android or iOS, but you'll find all the big-name apps you need in the Windows Store.

Indeed, the recent Windows Phone 8.1 update turns Windows Phone into a tempting proposition. We've always been fans of its colourful tiled interface, but the addition of proper notifications and the Cortana voice assistant, among other upgrades, is welcome.

The Nokia Lumia 530 has some very decent preinstalled software. We particularly like the excellent Nokia Maps application with HERE Drive+ for free navigation, as well as MixRadio, which offers unlimited ad-free music streaming, even offline.

Verdict

The disappointing thing about the Nokia Lumia 530 is that it feels like a worse phone than the Lumia 520 it replaces (albeit with a price cut). The display is a deal-breaker for us, undoing the good work of the Lumia 530's performance and build quality. If you really are limited in budget, it is worth considering. But we hoped for more. ☒ **Matt Egan**

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QNAP HS-210

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Specifications
Two-bay NAS drive; QTS 4.1.0 operating system; 1.6GHz Marvell single-core processor; 2x disk bays for 2.5- or 3.5in SATA disks; 512MB RAM; 1x gigabit ethernet; 2x USB 3.0, 2x USB 2.0; SD card slot; external 12 V/5 A power supply; 303x220x41mm

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

★★★★½

NAS drives are increasingly found in the home, offering a neat way to archive and access all your music, media and other important files. Whereas most are built for server rooms, the QNAP HS-210 will fit right in to your living room.

Companies such as Synology and WD have been making the NAS box more domestically acceptable for some time now, designing more shapely units in colours that will blend better into the home. Unfortunately, NAS drives' impact on the environment is not all visual – there's also the noise created by spinning disks and whirring cooling fans to consider.

WD has worked around the problem using a passively cooled chassis, relying on natural airflow to regulate temperature. That can work, providing you use low-power hard disks and slower ARM processors, although performance then tends to suffer. And highly perforated cases do little to stifle the noise of disks within.

QNAP's solution is the HS-210, which is also passively cooled, only with the help of a large metal plate across the top of the case that serves as a heatsink radiator. This also helps reduce audible disk noise, the only moving part in this fanless design. And without the constant flow of air inside, the HS-210 won't pile up dust as do fan-cooled designs.

But a similar compromise has still been made in its processing power, with only a lowly 1.6GHz ARM processor from Marvell, single-core and built for cool running and power efficiency more than heavy lifting. For a media-serving NAS hub in the lounge that may not be such a problem, although disk write speeds will likely suffer.

Build and design

Contrasting with every other NAS drive we've seen, the HS-210 is styled more like a TV set-top box than a network drive. It's 303mm wide, 220mm deep and just 41mm high, giving it a flat aspect with its two hard disks mounted side by side. These are entirely hidden from view behind a neat plastic guard that covers the entire front panel.

Pull off this magnetically attached fascia and you can access the drive caddies – each hard disk is mounted in its own slide-in sleeve.

The casework is predominantly glossy black plastic, save for the brushed aluminium plate in anodised black that covers the top surface.

On the rear is a slightly unconventional array of ports and connectors. There's a single gigabit ethernet port, two USB 3.0 ports, two USB 2.0 and an SD card slot.

We'd imagine the HS-210 being of most interest to audiophiles and film buffs, those whose media collection requires the healthy sized repository that's possible with a pair of RAIDed hard disks. At this time the state of hard-disk art stretches to 6TB per drive, giving you 12TB of fast RAID 0 storage – albeit with no protection should one disk fail.

Alternatively, you could mirror the disks with a RAID 1 arrangement, halving usable capacity but with full-time protection against one disk breakdown. QNAP's QTS operating system also allows a concatenated JBOD, pooling two disks; or you can configure with two simple volumes.

QTS 4.1 is a gaily coloured affair, its user graphical interface taking from other popular trends in OS design. Large iPhone-style icons populate the dashboard, providing quick links to the main Control Panel, various media stations, cloud sync and IP cam surveillance areas.

If you click on a speed dial-style icon in the bottom-right screen corner a large system monitor panel slides out, a trick we first saw with Synology's DSM.

It's worth noting that it's now possible to leave your audio, video and photo files in any directory on the NAS. They will still be scanned and indexed by relevant applications, such as Music Station, Photo Station and Video Station.

Performance

We tested essential file serving speed, setting up the HS-210 for best possible performance with a pair of large disks in RAID 0 mode. Since the defining matter of the NAS speed is typically the gigabit interface, and then the processor speed, this gives an idea of its overall capability, although data throughput would be reduced in a RAID 1 setup, for example, as the disks become more full.

We used two 3TB WD Red 3.5in SATA disks optimised for small NAS use. These disks are also some of the quietest we've experienced, and suitable for use in living rooms when truly silent operation is not essential. If it is, you could also configure the QNAP with 2.5in SSDs, although the maximum capacity would be limited to 2x 1TB, and you'd pay around £600 for these SSDs.

Tested with SMB/CIFS networking protocol as used by Windows PCs, we saw top sequential read speeds of 53MB/s and best write speeds of 41MB/s. Small file transfers were impressively speedy, averaging 38MB/s for random reads and 26MB/s random writes (4kB to 1024kB data averaged).

Used with the AFP protocol preferred by Macs, top sequential speeds reached close to the gigabit ethernet limit of 111MB/s, quite consistently with all data from 2- to 10MB in size. Sequential write speeds reached their maximum with 20- to 100MB sized data, typically around 58MB/s. That's a good result for a single-core ARM processor.

Small-file performance dwindled here, though, averaging just 2.7MB/s for 4- to 1024kB random writes.

When idle the unit drew 10W of power, rising to 15W under load.

Verdict

The QNAP HS-210 is a smart and stylish NAS drive not just for the home but potentially the living room, too. Thanks to passive cooling, it's calm and quiet, and can be made silent if your storage needs and budget can accommodate SSDs.

☒ **Andrew Harrison**

$349 (£299)

Contact
- apple.com/uk

Read more
- tinyurl.com/oLusuj2

SMARTWATCH

Apple Watch

PREVIEW

As expected, Apple has announced a smartwatch. The biggest surprise is, perhaps, its name: Apple Watch, rather than iWatch as had been expected. The best news is that Apple's hasn't just launched a smartwatch, it's launched a whole raft of smartwatches. By combining the three different Apple Watch categories, the two different face sizes, and the accompaniment of straps, there is the potential for 34 different Apple Watches, so there is a style to suit anybody. And crucially, since Apple is offering two watch face sizes, the Apple Watch will be as comfortable on a female wrist as it is a man's wrist.

Design

We've seen lots of fitness trackers over the years and they have struck us as pretty formulaic. Those plasticky wristbands have never really appealed, and no matter how much they tried to be fashionable, there's nothing fashionable about wearing a bit of plastic around your wrist.

It's a similar story with smartwatches. Sure over the past year they have become more and more popular with guys looking for the latest tech gadget, but they don't appeal to everyone. One major issue is that most smartwatches we've seen are designed for men. They wouldn't sit comfortably on a smaller wrist.

This is where Apple, with its design expertise and its ability to appeal to the masses comes in. Where other companies have failed to come up with a smartwatch design that suits anyone, Apple has solved the issue by coming up with multiple designs to suit everybody.

Rather than try and make one watch to suit everyone, it has designed three basic Apple Watch varieties that are targeted at different groups of people. The Watch Sport, for example, is ruggedised and features strengthened Ion-X glass face, so it should be able to take some bashing around. It's also the lightest of the three Apple Watch editions because its case is made from anodised aluminium. The Apple Watch Edition is clearly designed for the fashion conscious, with its beautiful 18-karat gold case available in yellow or rose gold. That model even comes in a fancy leather box that doubles as a charging cradle.

The watch face itself comes in two sizes, as we mentioned above. One is 42mm high; the other is 38mm (that's about 1.5in and 1.6in). The Apple Watch's sapphire or Ion-X glass face (depending on which model you opt for) sits in a case made from the following material, depending on which of the three models you opt for (Apple Watch, Apple Watch Sport, or Apple Watch Edition). These finishes include: Stainless Steel, Silver Aluminium, 18-karat Yellow Gold, Space Black Stainless Steel, Space Grey Aluminium and 18-karat Rose Gold.

There's also a collection of straps to choose from, including: Link Bracelet, Sport Band, Leather Loop, Classic Buckle, Modern Buckle, and Milanese Loop. The Leather Loop and Sport Band options are offered in multiple colour choices. The Sport Band comes in black, white, pink, blue, and lime green, for example.

If that's not enough customisation options for you, there are a number of watch faces to choose from, too – some are even animated. And you can even change the colours and design elements of these.

User interface

Of course Apple's design expertise is only a small part of what makes the Apple Watch stand out. Another factor in its favour is the user interface. The problem many of the current smartwatches have is that the UI is packed on to a tiny display and you need to manipulate those tiny visual elements using your fingers – which are inevitably bigger than the elements you are trying to touch.

Digital Crown

Apple's solution is to utilise something that has always been a feature of watches in a new way. The dial on the side of the watch has been bought into the 21st century and turned into what Apple calls the "Digital Crown". This solves the problem of swiping through icons on a minuscule display. You can use

the crown to zoom in on interface elements and scroll through content on the watch face, without your fingers obscuring the view. It reminds us of an iPod's Click Wheel, and can be used to navigate through lists as well as zoom in on data, maps or photos.

Force Touch

This doesn't mean that the watch face isn't touch sensitive. You can tap and swipe the Apple Watch face. In fact, it's able to determine just how hard you touched the screen. It can distinguish between a regular tap, used to select things, and a harder press, used to access contextual menus. Apple refers to this technology Force Touch. It is made possible by tiny electrodes that are embedded in the display.

You can swipe the screen to access summaries of things such as your location, the weather, and your calendar. Apple calls these mini apps Glances. They show you only the most relevant information from apps in a format suits the Watch's screen.

Taptic feedback

You aren't the only one doing the tapping when it comes to the Apple Watch. The watch incorporates what Apple is calling a "Taptic Engine". This enables it to 'tap' your wrist to alert you to notifications. These could be for messages from friends, or to tell you to turn left or right if you are following directions. It's similar to the vibrate function on an iPhone, except that only you know that you are being nudged. Let's face is, when your phone vibrates everyone knows when you get a call, even if you have the sound off.

Digital Touch

There's another feature of the interface that centres around touch. Apple calls it "Digital Touch" and it's a quick and clever way of contacting friends via their Apple Watches in a way that suits the constraints of the interface. You can use Digital Touch to draw on your watch face and send that to your friend. You can even hold down two fingers in Digital Touch to send your heartbeat (so romantic). This shows up on your friend's watch as a glowing, pulsing heart. It's a fair bet that Apple's hoping couples will buy his-and-hers watches.

Siri

The other way you can interact with the Apple Watch is via Siri. Just raise your wrist and say "Hey, Siri", or press and hold the Digital Crown, and you can dictate messages or request turn-by-turn directions.

Apps

As mentioned above, there are various 'apps' on the Apple Watch. These are slimmed-down snippets of iOS apps, referred to by Apple as: "Glances". Based on what we saw from Apple's presentation on the 9 September, the company has shrunk down some of the most common apps for the Apple Watch UI. You will be able to 'Glance' at Messages, Mail, Weather, Calendar, Maps, Passbook, Music, Photos, and more. There are a few apps that Apple doesn't appear to be translating to this interface, though, such as Safari.

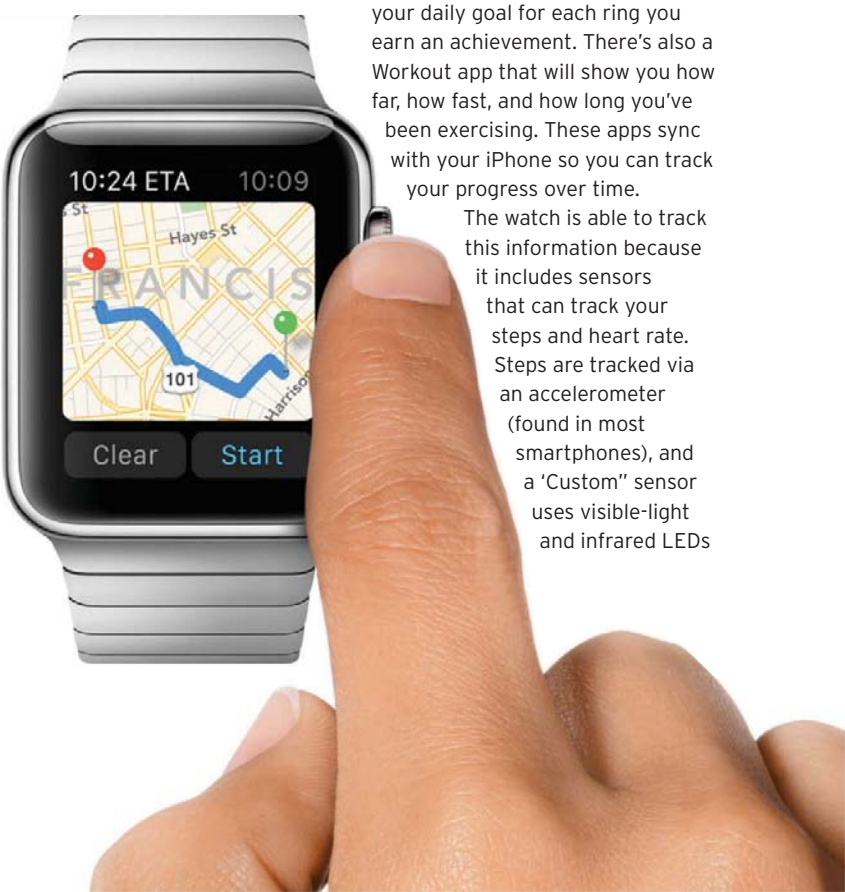
The Friends app provides you with a shortcut to all the friends you might want to contact. Tap the image of a friend to send them a message or to place a phone call (routed via your iPhone). If you receive a message from a friend you can reply on your Apple Watch – you will see a selection of possible responses to choose from, or you can opt to send a (editable) emoji, or dictate a reply and send that – the Apple Watch has a microphone and a speaker, so you can talk to it and it can talk to you. You can also use the Digital Touch features mentioned above to send them a drawing of your choice, or just to let them know your heart is still beating. And yes, you can use the Apple Watch to make and receive phone calls, as well as transfer calls to your iPhone or a Bluetooth headset.

Thanks to the WatchKit SDK third-party developers will also be able to make Glances for the Apple Watch. Apple has already announced that an American Airlines app will provide you with a travel itinerary, and a Starwood Hotels app will let you use Apple Watch to open your room door at W hotels. We like the idea of the BMW app that will help you find where you parked your car.

Health and fitness

Much of the focus has been on the fitness and health apps being built for this watch. Apple showed off its own Activity app. The Move ring displays how many calories burned, the Exercise ring shows how active you've been, while a Stand ring keeps tabs on those times when you weren't moving. When you meet your daily goal for each ring you earn an achievement. There's also a Workout app that will show you how far, how fast, and how long you've been exercising. These apps sync with your iPhone so you can track your progress over time.

The watch is able to track this information because it includes sensors that can track your steps and heart rate. Steps are tracked via an accelerometer (found in most smartphones), and a 'Custom" sensor uses visible-light and infrared LEDs



and photodiodes on the back of the device to determine your heart rate. The Apple Watch is also able to determine how far you have run or walked based on the GPS data from the iPhone it is paired with – the Apple Watch doesn't feature a GPS chip itself.

Apple Pay

That button we mentioned earlier – the one just below the crown – is also the way you use your Apple Watch to make payments using Apple Pay – Apple's mobile payment system.

Simply double-click the button and hold up your watch to a payment reader. This is made possible because the Apple Watch includes an NFC chip (as rumoured). But that's not all; there's also a dedicated 'Secure Element' chip that stores encrypted information about your credit and debit cards. It doesn't store your actual credit card number, but rather a device account number that's used to create a single-use security code to authorise each transaction.

For added security: if you take the Apple Watch off, it'll lock and require a code before you can purchase anything. Apple says the watch's rear sensor can tell whether the device is being worn and you need to enter a PIN when you put it on before you can use it. Thieves who don't know your code won't be able to use the watch.

Specs and features

Many of the Apple Watch's features require an iPhone to be present, though, not all of them. You don't, for example, need to carry your iPhone with you when you go for a run, nor do you need your iPhone when you wish to make a mobile payment using Apple Pay.

The good news is that the Apple Watch will work with any iPhone from the iPhone 5 up. So you probably won't need to buy a new phone to go with your watch.

Some are disappointed that it doesn't include a camera. Unless you are an undercover spy, it's unlikely you would want to take pictures with your watch. We can see it being added as a feature in a future Apple Watch, as it would make video calls possible and allow people to send selfies to others. It's not such a big failing either, because the Apple Watch can act as a viewfinder for your iPhone's camera, letting you snap pictures from afar. That's a much more useful feature than trying to take a picture with a camera strapped to your wrist.

We'd heard rumours that the iWatch will offer 8GB storage and 512MB RAM, but Apple hasn't offered any details relating to this, so we don't know how much storage there is in the Apple Watch, but we do know that there is some. We also don't know whether the Apple Watch will be available with different storage capacities. It's unlikely that the Apple Watch will need much in the way of storage, though, as it will work in conjunction with the iPhone and iCloud, so storage needs will be minimal.

As mentioned earlier, the watch has a near-field communication, or NFC chip as well as a 'Secure Element' chip to store your encrypted information. It also has sensors to measure blood pressure and distance travelled. It doesn't include GPS, instead it hooks up to the GPS inside the paired iPhone.

You can also control the music playing on your iPhone via your watch, or even play music stored on the watch itself. We presume if you are enrolled to iTunes Match you will be able to play any of the music you have stored in iCloud this way.

Apple claims the Apple Watch is water resistant, but it's not waterproof, so don't take it swimming. Finally, the touchscreen is covered by a sapphire crystal or Ion for extra durability, which should make it scratch-resistant.

Battery life and charging

Apple seems to be suggesting that you'll need to charge it everyday. During the presentation Apple said it had designed the device for "easy nightly charging" with the magnetic charger (see the image above).

We like the look of the magnetic charging attachment. It's similar to the MagSafe plug used on MacBooks in that it snaps into place on the back of the watch. There are no exposed

charging contacts so the charge is delivered via induction. That's have lead some to think that this is wireless charging, but it's not true wireless charging.

Price & availability

We're still awaiting UK pricing and, based on previous experience, we expect we'll still be waiting in January. US pricing starts at $350, which is not cheap, but we do think it is comparable with the price of some of the more desirable watches you might see in your jewellers. Indeed, some people will pay much more than that for a watch. Our best guess for UK pricing is £299.

The Apple Watch won't ship until early 2015. We hope that Apple is able to ship the watch in January, but we won't hold our breath. It may also ship in the US before it ships in the UK, and ApplePay will take a while to cross the pond.

Verdict

This isn't the first ever smartwatch, but Apple has paid an enormous amount of attention to every last detail of this watch and it shows. It looks like something that people with a bit of fashion sense would want to wear, as well as the rest of us. The Apple Watch may well be the smartwatch that converts the masses to the benefits of wearable technology. We can't wait to get our hands on one. ☒ **Karen Haslam**

SMART HEATING SYSTEM

Nest Learning Thermostat

£179 inc VAT

Contact
■ nest.com/uk
Read more
■ tinyurl.com/kkp4eng

Specifications
Smart thermostat requires internet connection (Wi-Fi), Heat Link and Nest display must be within 30m of each other; up to 10 thermostats can be controlled on one system

Smart thermostats are hot property right now, with gas suppliers quick to get in on the act and bundle them with certain tariffs to woo prospective customers.

The UK version of the Nest isn't the same hardware as that which is sold in the US, which explains the delay in the UK launch. Houses in the US use different heating systems as they're required to cool as well as heat. In the UK we've barely any need for air conditioning, and are more concerned with keeping warm.

The Nest stands out with its circular colour LCD display, making it a gadget you'll want to show off rather than hide away – as with the Hive (reviewed on the opposite page). Because there's a display you don't need to launch a mobile app to change the temperature, yet the Nest is no more expensive than those thermostats without a screen.

The stand was developed especially for the UK, but it'll cost you an extra £29. This might be useful for some, but most people should be able to use their existing in-wall thermostat wiring to power the Nest's screen. The kit even includes a plastic plate to cover up the old wallpaper, paint or holes you find when your installer removes your old thermostat. That's because the display is much smaller than you expect, just 83mm wide.

The display itself is has a 44mm diameter and a resolution of 320x320 pixels. Viewing angles are good left to right, but not when viewed from below. If your old thermostat was mounted high up on the wall, contrast won't be great.

The rotating dial surrounding the display oozes quality. It doesn't click: the sound you hear comes from the speaker inside the device. The whole unit can be pushed to select options (and enter the menu), and settings can also be tweaked via free iOS and Android apps. Don't worry if you're using Windows Phone: you can access these settings plus energy reports via the Nest website.

A hidden sensor below the display detects movement and automatically turns on the screen as you walk by on raise your hand to use the dial. Another sensor detects if the sun is shining on the display and ensures it doesn't play havoc with the internal thermometer, which would otherwise signal that it's time to turn off the boiler.

Heat Link

The other gadget in the box is the Heat Link. This attaches to your boiler, and connects to Nest over Wi-Fi rather than ethernet. If your wireless network coverage is up to the job, this is a much neater solution than most.

The Heat Link has a button that can put the Nest into manual mode, and holding it down for 10 seconds resets everything.

The Heat Link is compatible with the vast majority of heating systems, including combi-boilers, those with hot water tanks, underfloor systems, air-source- and ground-source heat pumps and others. You can check compatibility via Nest's website.

How it works

At its most basic level, you can use the Nest just like any other thermostat, simply using it to dial up or down the heat. But it's smarter than this, and you'll probably find you won't need to touch the dial (or app) once the system has learned your schedule: for the first week or two after installation you're encouraged to turn down the dial when you leave the house, and up when you return.

Alongside this 'training', the movement sensor detects whether anyone is in the house. If not, it will automatically turn down the heat. Pets won't set off the sensor, so you won't waste gas heating up the house for your cats.

You can also remotely control the temperature and change settings using the app.

The thermostat is also a programmer, so you can use it to set a schedule. However, instead of simply 'on' and 'off', you set the temperature you want your home to be when you get in, and a low temperature for all other times.

Thanks to the learning process, the Nest will automatically create a schedule, and you can see in the app whether changes in temperature were due to someone moving the dial or a scheduled change.

In the couple of months we tested Nest, the auto-schedule produced some very odd timings. However, given the time of year and the fact no heat has been required it's difficult to draw any conclusions.

You can check the status of Nest's learning feature by going to the settings in the app or on the website, where each feature will either say 'Ready' or 'Learning'. You can also disable any you don't want, apart from Leaf and Time-To-Temp.

The Leaf appears on the display when you set the dial to an energy-saving temperature, encouraging you to keep the heat below 19ºC.

Zones

Some rival smart thermostats allow you to control the temperature in different zones around the house. Nest can do this, too, but the drawback is that you need one Nest thermostat for each zone, meaning it's not a cost-effective option.

With a single Nest thermostat, you're reliant on any existing 'dumb' thermostatic radiator valves to shut off radiators when the set temperature is reached.

Nest Protect

Nest integrates with the Nest Protect smoke- and carbon monoxide detectors, which cost £89. These are much smarter than traditional alarms, giving vocal warnings rather than meaningless beeps. The integration also means you'll get a notification on your smartphone or tablet – useful if you're away from home.

Verdict

If you need only a single thermostat and don't want control over several zones, the Nest is a good choice. The Nest Protect smoke and carbon monoxide alarm also works with the thermostat, but it's not cheap.

☒ **Jim Martin**

SMART HEATING SYSTEM

Hive Active Heating

£199 inc VAT

Contact
■ hivehome.com
Read more
■ tinyurl.com/mppe6h5

Specifications
Requires at least one free ethernet port on router and broadband internet. Apps available for iOS and Android

Smart thermostats are like buses and, well, you know the rest. For the best part of 30 years there were no technological advances in thermostats, and now everyone wants to sell you an internet-connected box that lets you control your heating from anywhere.

You've probably heard of Nest (reviewed on the opposite page), but maybe not some of the others such as Tado, HeatMiser and HeatGenius.

These systems all do pretty much the same thing: they allow you to use your tablet, smartphone or PC to control- and monitor your home heating system. A key advantage is being able to remotely turn on or off the heating.

British Gas is offering Hive, but you don't have to be a British Gas customer to use it. The system costs £199, which includes professional installation. Or you can opt for the £159 DIY installation kit.

It works with most boilers, but you can check compatibility on the Hive website.

Installation

Opt for the professional installation and you'll need to make an appointment for an engineer to install Hive at your property. This takes around an hour and a half.

A mains-powered hub is connected to connected to a spare ethernet port on your router; there's also a receiver that connects to your boiler and a wireless thermostat.

The engineer showed us how to set up the app on our iPhone and check that everything was working as it should. Even without reading the manual, the system is easy to understand and use.

The thermostat doubles as a controller unit and runs on batteries, so can be installed on any wall. Unlike Nest, the Hive thermostat needs to be permanently installed in one place. There are guidelines on where it can be positioned, but the engineer will recommend the best location for your heating system. In our case, it simply replaced the old thermostat in the hall.

The last step is to create a Hive account online. You can use the thermostat to controller everything if you prefer, but this defeats the purpose of a smart heating system. Plus, the app can be far more convenient, and you can see live energy usage information.

There are free apps for iOS and Android, and a Windows Phone app is in the works. Once you've entered your account details, along with the hub ID, you're ready to use the Hive.

Features

The apps are designed well, both clear and intuitive to use. While you can use the app on a tablet, it's clearly designed for a smartphone's smaller screen. We preferred the look of the web app over the mobile version, since it has clearer navigation and makes it easier to set up the schedule.

In the app, the heating section has three main controls: Schedule, Manual and Off. The hot water control also adds a boost feature, which could be handy if you're heading home early and want to make sure there's enough hot water for a bath.

Hive tells you the current temperature and what temperature the heating is set to. You can adjust the set temperature by simply swiping up or down on the screen.

When in the Off position the system automatically goes into a frost-protection mode. If the temperature inside dips below 5ºC, the heating will turn on to prevent pipes from freezing.

A seven-day, 24-hour schedule is preset, but you can easily tweak this to suit your lifestyle. This is fun, with the web app's large, colourful and easy-to-understand controls.

Apart from controlling your heating- and water temperature and setting a schedule, there are many other options.

You can manage your Hive devices. The app will show you whether the hub, receiver and thermostat are connected to each other, their signal strength and their power- or battery status.

You can also set up notifications, which means Hive will alert you when the temperature reaches a specified level.

You can set up a PIN lock, too, which will prevent others, for example kids that share your tablet, from changing Hive's settings.

If you don't have a smartphone, or it doesn't run iPhone or Android, then you can enable Text control, which allows the system to be controlled by text message.

A new addition to the Hive mobile app is geo-location. With this enabled, your smartphone will automatically notify you of your specific Away and Home temperature settings, or if the heating is on or off, when you leave your home or as you come back. You can also change the distance of these 'Trigger areas'.

Verdict

The Hive Active Heating system is a great upgrade for anyone who wants or needs the ability to be able to remotely control their heating. It's by no means the most advanced (or good-looking) smart thermostat, but it will do the job for most people.

☒ **Dominik Tomaszewski**

DAB RADIO

View Quest Hepburn

£160 inc VAT

Contact
■ viewquest.co.uk
Read more
■ tinyurl.com/qb8wvex

Specifications
Portable kitchen radio; FM/DAB radio; 2x 58mm BMR drive units; 10W/channel amplifier; 3.5mm auxiliary input; Bluetooth A2DP with SBC audio codec; control through optional smartphone app via BT; two-line LCD display; collapsible aerial; mains or battery power (4x D); 314x166x94mm; 1.5kg

Build:
Features:
Performance:
Value:

Like Hollywood actresses Katharine and Audrey, there's no relation in the Hepburn name here, save a chance to conjure a classy-sounding image for a retro-styled kitchen radio – with some new-style features.

The View Quest Hepburn is certainly a classic-looking design, copying the 1950s look of the famous Roberts Radio. More specifically, the Hepburn is based on the Roberts Revival model, still in production today in DAB/FM form.

The View Quest Hepburn is likewise a portable radio, powered by a mains wall-plug adaptor as standard, or you can load four D batteries to use it on the move.

Even the price is aimed at the Roberts original, cheekily undercutting the £160 Revival by a potentially decision-swaying tenner. But the Hepburn offers even more wireless options, with Bluetooth audio connectivity.

While the Bluetooth feature gives another string to the salesman's bow, View Quest has fitted a basic version of this poor alternative to a length of interconnect cable. The Flairmicro module inside is for ultra low-cost devices, and seems to support only the lowest quality SBC codec. Consequently, any music sent over this link is reduced in quality like a low bitrate MP3.

Besides playing music over Bluetooth the Hepburn is at heart a radio for either analogue FM or digital DAB broadcasts. We found its FM tuner is not very sensitive, and it struggled to pick up radio cleanly from our central London offices.

We heard strong background hiss on many programmes, which can be reduced by switching reception to mono. We had to hunt for it, though – it's not a simple button toggle on the top panel; you must instead go through the radio's layered menu system to find Forced Mono.

Manual tuning isn't always easy, since the output temporarily mutes as you move in 0.05MHz increments, making it tricky to simply sweep through for a likely station. You can automatically tune by first twisting the tuning knob and then pressing it down to send it searching for stations. In short, a true analogue FM radio is more user-friendly for finding stations.

A two-line LCD display gives feedback on which stations are tuned, and volume is shown when the knob is adjusted. The display can be read clearly only when you look directly down upon it.

A useful control feature is available with an iPhone app. With this you can switch between sources and adjust volume. Tuning of FM and DAB radio stations is also possible. The DAB station graphic is shown in the app, too, but we didn't see any added station detail in FM mode.

Build quality is serviceable, finished in imitation padded leather front and back, although the case construction is entirely plastic.

Sound quality

As a portable kitchen radio, hope for high-quality sound cannot be held high. The Hepburn met our modest expectations.

The overall tone is like that of a low-cost transistor radio, with little bass although treble sounds reasonably well extended. Inside the radio is a stereo pair of small speaker drivers, designed to blend the effects of a distributed-mode loudspeaker (DML) with a traditional moving-coil diaphragm.

Amplifier details are not given, but the low power consumption and tiny, cool-running circuitry suggest the specified 10W per channel is from a Class D module.

With DAB stations the radio has a thinner and slightly brittler sound, even with BBC Radio 3's highest broadcast bitrate. Compared to analogue, DAB can sound tizzy.

Music sent over Bluetooth can sound somewhat grainy and on-edge. With FM received poorly in our location, and DAB proving again to be far from high-fidelity, we found the best-sounding results were from an external audio input, plugged into the 3.5mm auxiliary jack at the back.

Dictation is clear enough for spoken radio commentary, and there is no euphonic chestiness to male voices, for instance. But some of the effect of NXT speaker technology can be heard much of the time – the Hepburn has an unusually wide sound dispersion characteristic, such that tonal quality is the same wherever you hear it in the room.

The Hepburn doesn't have a particularly sweet tone, but it does stay consistently lacklustre from a range of listening positions.

Lest we are accused of taking musical quality too serious for this piece of audio equipment, we must remember that it's about more than just sound. "At View Quest we believe that colour is an important part of who we are," reads the product description. To wit, the Hepburn is available in seven colour finishes: black, light cream, light powder blue, leathery brown, mustard, brick red and horizon blue.

Verdict

The Hepburn is a vintage accessory that copies heavily from the Roberts Radio line of classic kitchen radios. It offers several ways to hear music and impresses with its range of sources if not so much by its sound quality. ☒ **Andrew Harrison**

HEADPHONES

OPPO PM-1

PC ADVISOR GOLD

£1,099 inc VAT

Contact
- oppodigital.com

Read more
- tinyurl.com/L56bm4L

Specifications
Planar magnetic headphones; open-back circumaural design; 32 ohm nominal impedance; 102dB from 1mW sensitivity; 85x69mm membrane drivers; wooden presentation box; denim zipped carry case; 3.08m OCC cable with 6.35mm (1/4in) jack plug, 90cm OFC cable with 3.5mm jack plug; 395g without cable

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

★★★★½

Nearly every pair of headphones ever made works on the same basic principle. They are dynamic microphones working in reverse, miniature loudspeakers with diaphragms that vibrate in tune with the music, set in motion by an attached coil of wire moving within a ring magnet. Not so these OPPO PM-1 headphones, which create acoustic vibrations in air – the very sound of music – by the planar magnetic principle.

Planar magnetic headphones and loudspeakers are hardly new, with respected designs catching the ears of audio enthusiasts since the 1970s. But they are more difficult and expensive to manufacture, and have traditionally been insensitive to input power, which means you need more powerful amplifiers to achieve the same volume. And these headphones can be uncomfortably heavy from the added weight of magnets and supporting frames that fill each earpiece.

Build quality

The OPPO PM-1 headphones can be worn for hours with little or no fatigue, and their design is sleek and unostentatious.

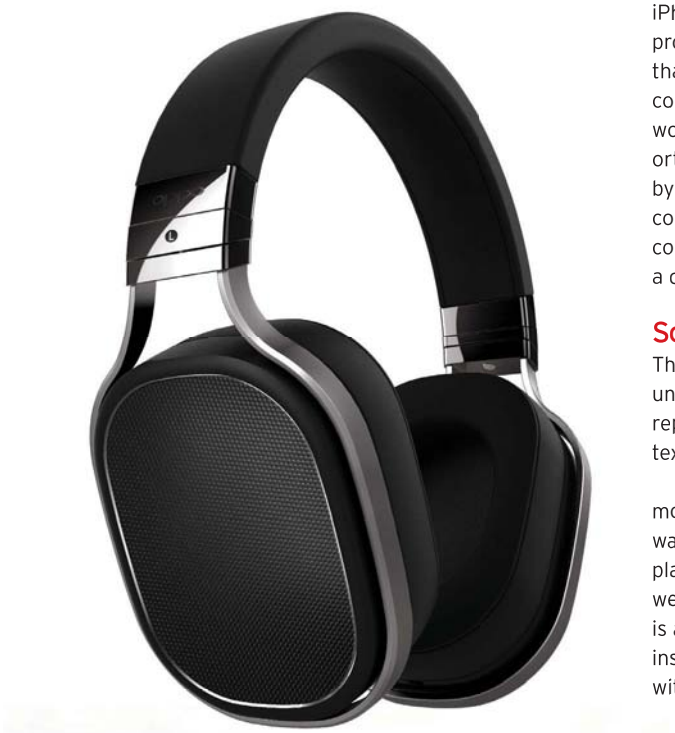
As a circumaural design, they have ear pads that encircle the ear and rest on the head. Gentle but suitably firm pressure is applied from a sprung-steel headband, wrapped in latex foam and covered with even softer real leather. To accommodate different shapes and sizes of head, the driver housings pivot about their centre in metal loops, and the entire speaker driver units rotate at the point they connect to the headband. Each side can rotate smoothly by 90 degrees, so you can turn the driver assemblies to lie flat – essential for carrying in the supplied case.

Two cables are included – a 90cm lightweight 3.5mm minijack cable, and a longer, heavier cable with a 6.35mm (0.25in) jackplug. Either is readily detachable from the headphones, plugging into 2.5mm mono jack sockets on the bottom of each driver assembly.

Two sets of ear pads are also included in the box. You can choose between premium-feeling soft pads covered with nappa leather and slightly thicker plush velour pads.

The overall build quality is first-class, with the swivelling parts moving slickly but precisely with no free play or stickiness. In use there is no creak or rattle, unlike even some high-end designs that can grate as they flex on the head.

In contrast to most planar magnetic headphones before them, the PM-1 headphones are relatively efficient and we found they could be driven to decent volumes by even an iPhone. Their high sensitivity is the product of a double-sided diaphragm that has twice as many aluminium conductors as other designs, working within the strong flux of an orthoplanar magnetic field created by neodymium magnets. And the conductors are arranged not in a concertina-like collapsed line, but in a circular or spiral array.



Sound quality

The OPPO PM-1 headphones provide uncannily smooth, wideband sound reproduction, with firm but subtly textured bass and glare-free treble.

Against any traditional moving-coil design we tried it was immediately obvious that the planar-magnetic PM-1 headphones were in a different league. There is a crystalline clarity that shows instruments in their natural state, with no added body or blurring that normally robs us of their unique character and detailing. Yet nor is there any disturbing lispiness or high-frequency spit that can accompany this kind of treble clarity.

Percussion is rendered quickly, without the common dragging of the beat or smearing of its punctuation. Drum sounds of all flavour are heard with almost original impulsiveness.

Vocals are another forté of the OPPO PM-1s. You can hear with ease the natural timbre of male voices, while higher-register female vocals can soar and dive with none of the synthetic screech or metallic edginess that can be added.

If anything, the PM-1s would benefit from a little more reach into the extreme high frequencies, as they did seem to tail off from the very highest of HF extension.

We particularly enjoyed the sound of guitars, the way they could be picked out by their metal stringy, buzzy character or the natural resonance of bodies and sound boxes; the same with banjo and mandolin. Fret buzz, squeaks and plectrum clicks are sometimes audible – the type of sounds recording engineers think they've erased, but are still present under the OPPO's microscope.

Stereo soundstage placement is truly excellent, placing instruments in easily spottable positions and fixing them there.

The OPPO PM-1 headphones are in essence an open-back design, although there appears to be plenty of damping material on their converse side, such that they're not as noisy to other listeners as the truly open-backed. We still wouldn't use them on public transport, since they also allow a great deal of ambient sound to filter through.

Verdict

They come remarkably close to our beloved Stax electrostatics in some ways, with a little less extreme HF reach, although the OPPO PM-1s stride ahead in their mastery of bass instruments. The build quality and meticulous attention to their engineering make these a high-end design in material science as much as in their sonic brilliance. They are a benchmark design and easy to recommend. ☒ **Andrew Harrison**

HEADPHONES

Rock Jaw Alfa Genus

£49 inc VAT

Contact
■ rockjawaudio.com
Read more
■ tinyurl.com/p4df5bh

Specifications
In-ear headphones; 8mm dynamic drivers; 20- to 20,000Hz frequency response; 108dB ± 3dB sensitivity; 16 ohms nominal impedance; 3x pairs of grommets; 2x pairs of filters; soft carry case; 1.2m cable; 11g

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

PC ADVISOR RECOMMENDED

You probably haven't heard of British company Rock Jaw, but that matters not one jot. What matters is the quality of the headphones it produces, and the Alfa Genus in-ear buds are astonishing at £49.

Engineered by music enthusiasts who wanted to produce high-quality headphones at a price that's much more affordable than premium brands, it's immediately clear that the team has succeeded brilliantly.

The Alfa Genus is made from a combination of aluminium and ebony. The 1.2m twisted cable is quite thin and doesn't resist tangling as well as some, so this is a pair of headphones you'll want to look after rather than abuse.

The 3.5mm minijack plug will fit most phone- and tablet cases, but its 90-degree bend might cause trouble if you're using a battery case.

A soft carry case is included in the box, as are three additional sets of rubber grommets.

Something we've not seen before are interchangeable filters. Once you've removed the rubber grommets, you can unscrew the currently installed filters and swap them for another pair.

In total there are three sets. Installed by default is the silver set which enhances bass. A champagne-coloured set provides a neutral response, while the black set enhances high frequencies.

It might sound gimmicky, but swapping the filters changes the sound appreciably so you can use the set that's most appropriate for your taste or what you're doing.

Using the monitor-style filters, the Alfa Genus has a decent and well-rounded response that is noticeably crisper, brighter and fuller than that of our previous favourite budget buds, the RHA MA450i.

With the bass filters installed, there's a big jump in low frequencies, giving punchy, warm bass.

Regardless of the filter, audio remains crisp and detailed, with no muddying of instruments: there's always clear separation.

Verdict

If you want great-quality sound at an affordable price, the Alfa Genus are the in-ear headphones for you. ☒ **Jim Martin**

IPAD KEYBOARD

Belkin QODE Thin Type Keyboard Cover for iPad Air

£89 inc VAT

Contact
■ belkin.com/uk
Read more
■ tinyurl.com/Lhjz276

Specifications
Bluetooth keyboard for Apple iPad; Smart sensing technology; TruType keys; 79 hours active battery life, 3,100 hours standby; shortcut keys; 1-year warranty

★★★½☆

Despite it being almost a year old, there aren't many keyboards for the iPad Air. Belkin's QODE is one of the thinnest around.

Available in white or grey to match the iPad Air, the QODE is just a few millimetres thick. It has a magnetic hinge so it can act as a cover for the iPad, but there's nothing to hold it shut – the idea is to put the whole thing into a sleeve or pouch in a backpack.

Pairing the keyboard is amazingly simple: tap the Pair button, then select the keyboard from the list of Bluetooth devices on the iPad.

When you want to use it as a keyboard, just pull apart the two and slot the iPad into the groove in the keyboard. A pressure switch turns on the keyboard and Bluetooth automatically, but this works best on a desk; it's somewhat hit and miss when using the Belkin on your lap.

Belkin says the 35-degree fixed angle is the 'ideal' one, and we're inclined to agree when using it on a desk. However, keyboards that allow you to change the tilt angle are better, if you can live with the extra bulk and weight.

The battery is at the back of the keyboard, and gives a slight angle for more comfortable typing. It should last months between recharges, unless you're using it all day every day – Belkin claims 79 hours of use.

The keys have sufficient travel and are large and well spaced enough to make typing as easy as it can be at this size. There's no noticeable delay when typing, so you can touch type as fast as you normally would – or at least you could if it weren't for the annoying placement of the apostrophe key to the right of the spacebar.

The top row is full of useful shortcuts for media playback, volume, switching between apps, a home button and even a dedicated printscreen key.

Verdict

If you don't touch type you might get on better with the QODE Thin Type Keyboard, but with no way to change the character that each key produces, the out-of-place apostrophe key is a bit of a deal breaker. Plus, of course, there's the issue of the price. It's steep at £90, despite the excellent build quality. ☒ **Jim Martin**

BLUETOOTH SPEAKER

Lumsing Prophet

£19 inc VAT

Contact
- lumsing.com

Read more
- tinyurl.com/Lfqyfdv

Specifications
Bluetooth 2.1+EDR speaker (up to 10m transmission); 2x 5W speakers; 90Hz to 20kHz frequency response; 76dB signal to noise ratio; 700mV+50mV input sensitivity; 1500mAh rechargable battery; NFC; 3.5mm aux; 500mAh 5V USB input; 120x120x32mm; 249g; one-year warranty

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

★★★★☆

Lumsing's Prophet is a Bluetooth speaker that costs just £19. While it may not be able to compete with high-end rivals such as Bose, you might be pleasantly surprised by this cheap Bluetooth speaker.

The Prophet is reasonably stylish, and easily portable at 249g. A sturdy black plastic disc with a swing-out tray to dock your device, the Prophet has the same diameter as an optical disc. A black brushed-metal surround adorns its top, while rubber feet keep it stable on the desk as it rocks out your tunes.

The only ports and buttons to be found are an on/off switch, a Micro-USB charging port, a 3.5mm minijack input and a volume dial. There's no way to see the exact volume setting, nor how much power remains (Lumsing claims up to 15 hours of playback, which is pretty good for a Bluetooth speaker).

On top is a single button that lets you switch between Bluetooth and AUX modes, play/pause music, and receive or reject phone calls.

The user guide isn't much use (complete with misspellings of the product's name), so it's lucky that the Prophet is so easy to set up and use. You simply turn it on, switch on Bluetooth on your phone or tablet, pair the two and start playing your tunes. You can also pair the devices using NFC, or hook them up with a 3.5mm minijack cable.

If you are using Bluetooth, note that it maxes out at around 10m distance, and potentially less as the battery runs low. If you'd rather leave your phone or tablet beside the speaker you can use the swing-out dock, but since the Lumsing is unable to charge your device you might prefer to leave it plugged into a nearby power socket.

Inside two 5W speakers are concealed behind black meshed material. The Lumsing Prophet is a very basic, no-frills Bluetooth speaker, but its sound performance is pretty good. It offers distortion-free sound, with significantly higher volume than can be offered by a paired phone or tablet.

The audio is clear and, although there's no dedicated app that lets you mess around with playback, you can always use a third-party app.

Verdict

The Lumsing Prophet comes at a great price. Audiophiles may not look twice, but for the rest of us who like a bargain that's exactly what you'll get. ☒ **Marie Brewis**

BLUETOOTH SPEAKER

Inateck BP2001

£28 inc VAT

Contact
- inateck.com

Read more
- tinyurl.com/n7y535u

Specifications
Bluetooth 2.1+EDR speaker; 2x 5W speakers; 90Hz-20KHz frequency response; 800mAh lithium battery; 240x62x41mm; 332g

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

★★★★☆

Inateck's BP2001 is a well-priced portable Bluetooth speaker designed to work with your tablet, but it's compatible with any smartphone, laptop, PC or other device with a Bluetooth connection or 3.5mm headphone jack.

It's more expensive than its little brother, the £15 Inateck BP1001B, but the BP2001 offers a vast improvement for an extra £13. Not only is this slightly less portable but just as sturdy Bluetooth speaker much better looking – an elongated dock that combines stylish matte, meshed and admittedly fingerprint-prone glossy black ABS plastic with a chrome effect trim – but it sounds better, too.

In our tests we found no distortion, even at our tablet's maximum volume, and the audio from the BP2001's twin 5W speakers is much clearer – and louder – than that of the BP1001B. True audiophiles with fat wallets may want to look elsewhere, but for most of us the Inateck will do a great job.

A dock at the top of the speaker lets you perch your tablet on top. The Inateck won't charge your device, but two vibration-reducing rubber feet and a built-in kickstand keep it secure and ensure it remains within the BP2001's operating distance (around 10m over Bluetooth). With the Inateck 240mm long we found our Nexus 10 just slightly overhung the speaker, but not awkwardly so. The dock's open-ended design lets it fit any tablet.

Despite previous problems using Bluetooth with this tablet, the Inateck found and paired with our Nexus 10 within seconds, and held on tight to that connection.

The Inateck also supports Bluetooth calls – you just press the large silver button at the Inateck's centre to accept a phone call.

This button also pause/plays audio, while LED symbols immediately below denote whether the Inateck is in AUX, Bluetooth or charging mode. There's no volume dial, but you don't miss it.

Verdict

The Inateck looks good, sounds good, and it's cheap. It's not in Bose territory, but if all you want to do is turn up the volume on your phone, tablet, PC or laptop, the BP2001 is a steal at £28. ☒ **Marie Brewis**

POWER BANK

EC Technology 1800mAh External Battery Pack

£30 inc VAT

Contact
■ iectechnology.com
Read more
■ tinyurl.com/pzufvbo

Specifications
Portable USB charger; 18000mAh lithium-polymer battery; 1.2A input; 1A and 2.1A full-size USB outputs; Micro-USB charging port; torch; 170x122x12mm; 540g; 12-month warranty

Build:
Features:
Performance:
Value:

Portable chargers are great for keeping your smartphone, tablet and other USB-connected devices going for as long as you do, and this 18000mAh External Battery Pack from EC Technology is more stylish than most in its 12mm ultra-slim matte-aluminium chassis.

It's also a lot heavier than most at 540g, and portable only in the sense that you might throw it in a travel bag. Pocket this power bank and it will pull down your trousers.

Our review sample is a sleek black slab, and the External Battery Pack also comes in stylish pink, silver and green. On top is EC Technology's logo, and below you'll find legends for each of the ports. Also here is a four-LED status light that doubles as a torch, although at 122mm wide this is the oddest-shaped torch we've ever held.

The problem with using an LED system to denote the remaining capacity is that each light represents a huge amount of battery capacity – 4500mAh here – which means you never really know how much remains.

Note that only around 70 percent of the quoted capacity will make it to your gadgets, with energy lost through heat generated and voltage conversion. This compares well with other power banks, which typically have a 65 percent efficiency rate.

With 18000mAh on offer, you can expect around 12600mAh to be available. That would fill an iPhone 5s (1570mAh battery) eight times.

Both 1A and 2.1A outputs are available, and you can plug a phone or tablet into either (they will draw only the power they need).

Slightly concerning is the 1.2A input. You can charge up the External Battery Pack using the charger that came with your phone or tablet, but at 1.2A it will fill up reasonably slowly.

Given that there are two USB outputs it's pleasing to see two USB cables in the box. These come with interchangeable heads for Micro- and Mini-USB and Apple's 30-pin dock. If your device uses a proprietary connection you'll simply need to plug in your own cable.

Verdict

This stylish power bank offers useful capacity to keep all your devices going for several days, and at £30 it's amazing value. It's not portable enough to throw it in a day bag, however, and it will take some time to recharge itself. ☒ **Marie Brewis**

POWER BANK

EC Technology 22400mAh High Capacity Power Bank

PC ADVISOR RECOMMENDED

£35 inc VAT

Contact
■ iectechnology.com
Read more
■ tinyurl.com/LhgftLj

Specifications
22400mAh portable USB charger; 1x 2.1A output; 1x 1A output; 2A Micro-USB input (fully charged in 14- to 15 hours); torch; supplied with two USB cables with interchangeable connectors for Micro-USB, MiniUSB, Apple 30-pin dock and one random (possibly an old Nokia charger); 1-year warranty; 160x79x22mm; 449g

Build:
Features:
Performance:
Value:

Of all the power banks we've tested of late, this 22400mAh USB charger from EC Technology has the highest capacity. It can charge an iPhone 5s 10 times away from the mains.

You might be wondering why, if an iPhone 5s battery is rated at 1570mAh, and this power bank offers 22400mAh, you can charge your iPhone 5s 'only' 10 times. As with all portable USB chargers, some of the power is lost through the transfer of energy and in the heat generated. Most chargers will lose around 35 percent of their capacity; this power bank will lose only 30 percent.

Given that there are dual-USB outputs – one rated at 2.1A and designed for but not exclusive to tablets, the other at 1A for smartphones – it's nice to find two USB cables in the box. These come with interchangeable connectors for Apple's 30-pin dock, Micro- and Mini-USB. You can plug in your own cable for other connections, too.

With such a large amount of portable power on offer, it's also pleasing to see the input rated at 2A. This power bank can recharge itself much faster than can its 18000mAh sibling reviewed above. Indeed, using a 2A charger the power bank can be charged up in 14- to 15 hours, but it'll take 27- to 29 hours at 1A.

Despite all that talk of energy loss through the heat generated, in simultaneously charging our phone and tablet the power bank never got even warm to the touch. It's not a huge amount larger than our phone either, although it's much heavier: at 449g this is a gadget you'll carry in your bag, not in your pocket.

It's not as good-looking as its Lumsing rival (tinyurl.com/mgo3926), but this power bank has a certain charm. Supplied to us in black with a red trim, the plastic chassis has rounded edges and corners, and feels pretty tough.

Four LEDs reveal how much capacity remains, but given that each represents a huge 5600mAh you won't get an exact reading.

It also features a torch, which may be useful on a camping trip.

Verdict

We can't believe such a huge amount of portable power can be had at such a low price. It's not as stylish or portable as the Lumsing, but it offers staggeringly good value for money. ☒ **Marie Brewis**

LAPTOP BAG WITH POWER BANK

Tylt Energi+

£160 inc VAT

Contact
■ tylt.com
Read more
■ tinyurl.com/kbbhwhe

Specifications
15.4in laptop bag; made from water-resistant 1680D polyester; laptop space: 393x267x38mm; 2.1kg

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

You may balk at the price, but the Tylt Energi+ backpack is more convenient than simply sticking a USB battery in any old rucksack.

If you're a commuter like me, you probably carry your phone and tablet around in a backpack. Some modern designs have dedicated pockets for these devices, but the Energi+ is the first we've seen to incorporate on-the-move charging.

The price includes a 4.1A battery that can charge three devices at the same time. Two of the USB ports can supply 5V at 1A, while the third outputs the same voltage at 2.1A.

There's a clever cable-routing system, which is accessible when you fully unzip the rear compartment and fold open the backpack. The big battery slides into a pouch and USB cables can be threaded into a choice of seven different pockets.

One is the dedicated tablet pocket, which is lined with a soft material to protect your iPad. Another handy pocket is the top one, which has a removable hard shell with two compartments: one for smartphones, and one for your sunglasses.

Other 'power' pockets include two of the side compartments, and three of the front compartments. At the back is a padded laptop pocket that will accept 15.6in notebooks.

A largish front compartment unzips to reveal yet more pockets (there are 13 in total), including some smaller ones. One of the side pockets has a fold-out mesh pocket for a water bottle, and there's a tiny pocket on the left strap that's is ideal for a pair of earphones. Another bonus is the removable, zip-up accessory bag.

The Energi+ has a capacity of 24 litres. For commuters that's just about right, but bear in mind that it weighs 2kg even when empty.

There's no chest or waist strap, and despite the generous padding it isn't the most comfortable of backpacks. Build quality is pretty good, but it's not top notch. The zips, for example, don't run as smoothly as we'd expect at this price.

The battery charged our iPad Air to 78 percent, with LEDs showing how much capacity remains. We found it could get hot in use, though, heating up everything in the bag.

Verdict

The Energi+ is well designed for carrying a laptop, phone and tablet, and the battery can charge three USB devices at the same time. It's just too expensive. ☒ **Jim Martin**

CAR CHARGER

Lumsing 70W Extended Socket & USB Charger

£7.99 inc VAT

Contact
■ lumsing.com
Read more
■ tinyurl.com/Ls2azbw

Specifications
Three-socket car cigarette lighter socket splitter; available in white, black or red; 70W output; 2.1A USB output; 95x35x70mm; 132g

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

The problem with every member of the family whiling away long journeys on their smartphones, tablets, MP3 players, portable DVD players, consoles and more is that as soon as the batteries run dry the screams of "Are we there yet?" start. With only one 12V socket (cigarette lighter socket) available from which to both charge your devices and power the satnav, someone's going to lose out.

Lumsing's solution to the problem not only offers a 2100mAh USB output for charging your phone, tablet and other USB-connected devices, such as a camera, but splits your single 12V socket into three, with a total output of up to 70W.

If you have several legacy devices that charge over the 12V port rather than 5V USB then you're laughing – especially at this price.

I can plug in my satnav, my travel straighteners and the 12V- to 5V USB adaptor I used to need to charge my smartphone. Now I have a spare USB socket for my tablet, too. Or someone else's phone, if they're lucky.

This Lumsing socket splitter is also useful if your 12V socket is in an awkward-to-reach position, serving as a 0.5m extension cable. This might come in handy if the kids in the back want to charge up their devices and continue using them, or even just so you can hide away the device if you find its bright LED distracting when driving at night. Sticky pads on the bottom of the device let you secure it in place so it doesn't fly around the car as you boot it off at the next junction.

The Lumsing socket splitter feels sturdy and well made, although the plastic casing is easy to scratch. Our review sample came in white; it's also available (and looks much cooler) in black or red.

Verdict

A simple, cheap solution to what is becoming an increasingly frustrating problem: keeping your devices going wherever you are. ☒ **Marie Brewis**

SATNAV

TomTom Go 50

£160 inc VAT

Contact
- tomtom.com

Read more
- tinyurl.com/k2a9r5h

Specifications
Satnav; European 'lifetime' maps; 5in (480x272) touchscreen; microSD support; windshield mount supplied; 145x91x22mm; 235g

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

★★★½☆

The TomTom Go 50 is a 5in satnav that's preloaded with maps for the whole of Europe, and has TomTom's latest interface.

Do you still need a standalone satnav these days? If you own a smartphone, it will probably have a satnav app and do a reasonable job of getting you from A to B. However, few smartphone satnav apps are as fully featured as the Go 50, nor are as easy to use.

In the box you get a USB cable and cigarette lighter adaptor for in-car charging. The Go 50 itself is well built and the mounting bracket offers a good amount of adjustment and a firm grip on your windscreen.

Getting around

The TomTom Go 50's screen is a resistive touchscreen like that of most other dedicated satnavs. The matte finish means that there's barely any glare or reflection, but you need to firmly press the screen to get a response. We found this okay for the most part, but the keyboard feels a little cramped compared to most smartphones and is much less accurate. You have to force yourself to slow down and press each key rather deliberately.

The menu system gives you many options, but you need to scroll through these with your finger because not all are displayed on a single screen. This is where the screen really struggles: resistive screens don't lend themselves to swiping gestures, and we often found ourselves hitting the wrong menu option.

Once you enter your destination it is displayed up on the large map (you can also speak your destination if you prefer – voice recognition is pretty good). You can then press the destination icon to zoom in to make sure it is in fact the right location.

With some niggles out of the way, let's look at the Go 50's highlights. We like the sleep mode, which lets you turn off the satnav when you stop for a break; it is quick to resume when you continue.

The screen is big enough and is easy to see even in bright sunlight. It dims when it detects night driving or when travelling through tunnels.

We particularly like the new interface, which uses more of the display for the map, and also shows real-time traffic information.

The navigation screen is split into two sections. The majority shows you your position on the map, while a strip on the righthand side gives you the usual information such as the ETA and how far away you are from your destination.

The bar also gives shows you what's coming up ahead, and how far until you reach events or places. You get live traffic warnings (including a great Jam Ahead warning), upcoming points of interest and even weather warnings.

We found this very useful on our long test drive through France, and were pleasantly surprised how well it warned us of heavy rainfall ahead. We got a few errant traffic warnings that turned out to be nothing, but in general, the warnings were useful.

Colour coding means you can see at a glance how bad is the traffic, and there's an estimate at the top of the bar that indicates how long a delay there could be.

The map is more interactive than before, so as well as showing your favourite locations, you can also tap on a location to get options to navigate there, add to the current route or perform a local search.

Certain cities are mapped in 3D, giving you more visual cues for navigation as you can see buildings around you and landmarks. Buildings are set back from the road and side streets are made more prominent, which helps in situations where you're unfamiliar with the area.

Bear in mind that one reason why the Go 50 is relatively cheap is that it's a 'smartphone-connected device'. Rather than having a built-in SIM like older TomToms, it relies on your phone for a data connection.

It won't use all that much data, but it will require your phone to support a personal hotspot feature. You'll need to make sure your tariff allows tethering and potentially also one that works abroad.

Verdict

The TomTom Go 50 is a great satnav with lots of useful features, but we'd like to see menus that are easier to use. As long as you have a compatible smartphone and tariff, you'll benefit from timely information on traffic jams and even bad weather. It's easy to use, and it's reassuring to have free map updates. If you don't need full maps of Europe and can live with a slightly smaller screen, the Go 40 is £20 cheaper. ☒ **Dominik Tomaszewski**

INTERNET SECURITY

Bitdefender Total Security 2015

£60 inc VAT

Contact
■ bitdefender.co.uk
Read more
■ tinyurl.com/nnL9L9g

System requirements
Windows XP/Vista/7/8; 2GHz Intel Core 2 Duo; 1.5GB memory; 2GB drive space

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

★★★★☆

Bitdefender is regarded as one of the best technical Windows internet security suites for PCs and laptops, and Total Security 2015 lives up to that reputation.

With a wide range of features on offer, Total Security 2015 goes a step further and aims to make life even easier for customers by introducing Profiles. These adapt the software for particular tasks, such as playing games, watching movies or general office work.

Following installation you're presented with a Windows 8-style tiled interface. Rather than having a lot of tiles slide awkwardly through the Bitdefender window, as was the case in the 2014 version of Total Security, here there are three large tiles and four subsidiary ones, giving quick and easy access to all the program's key functions.

Features

The modules provided by Bitdefender Total Security 2015 cover antivirus, anti-malware and anti-spam, tune-up, online banking protection, a two-way firewall, parental control, online backup and anti-theft provision.

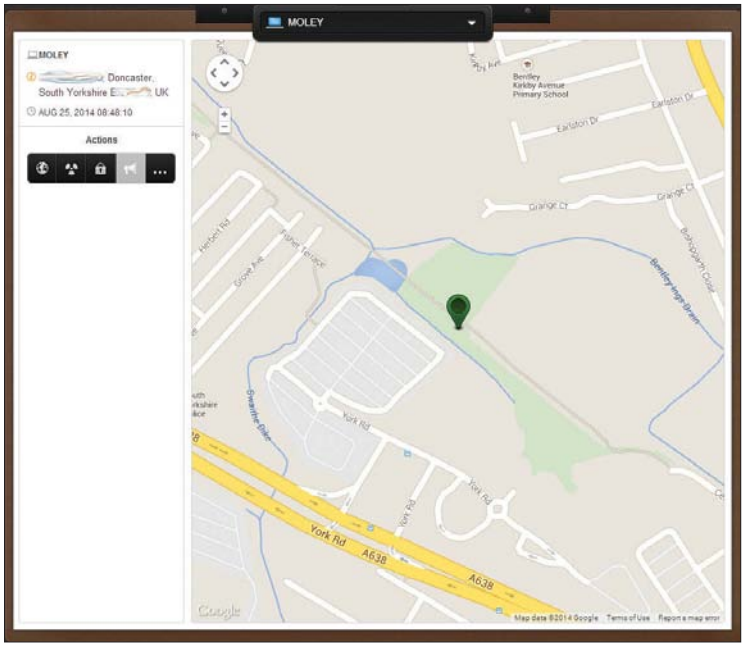
Online backup, which Total Security refers to as Safebox, is handled from the My Bitdefender site. This is unusual – it's more usually set up and managed locally.

It works by synching the files and folders you select with offsite storage and offers 2GB of space. This is paltry in a security package that caters to three PCs, although you can buy more storage.

System optimisation looks at three areas that might need attention: the hard disk, Windows Registry and privacy.

After we'd adjusted the default settings to leave the browser caches and history alone, Total Security 2015 still managed to recover 8.7GB from our test system, which is worth having back. You can run the optimiser with a single click.

The anti-theft features include locating-, locking down- and wiping a stolen laptop, although there's still no facility to take a photo of the person using it. While testing Bitdefender on a desktop PC, the locate facility repeatedly reported we were in a suburb of Doncaster, a place we've never knowingly visited (although we're sure it's very nice). Since this writer is based in Devon that's not very encouraging.



The Profiles, other than the Standard one applied by default, are for work, games and videos. They postpone protection- and maintenance tasks that impair performance and put off automatic Windows Updates. Like many tasks in Total Security, you can leave selection of the correct profile to AutoPilot, which automatically manages the security suite when engaged.

Performance

Our tests showed a fairly low scan rate of 54.5 files per second, but good file fingerprinting, dropping the number of files scanned from 79,145 to 14,703 on a second scan.

We measured very little resource hit, too, with just a 10 percent impact on our copy test when also running a background scan with Bitdefender Total Security 2015.

Independent security testing lab AV-Test.org has awarded Bitdefender Total Security top marks in its test groups for the past three years, which is a notable achievement.

When it tested Total Security 2014 it reported an overall score of 17.5 out of a possible 18 points, which breaks down into perfect scores in Protection and Usability, and 5.5 out of six for Performance.

Performance looks at how much the software affects the overall speed of the system, and here it gave just a one-second knock-back against five seconds for the group in which the suite was tested. A very good result.

Verdict

Bitdefender is consistently among the best internet security suites we test and also provides the best antivirus protection, according to AV-Test. There are a few small chinks in its armour, though. The synching process for online backup is by no means clear and 2GB of storage for a three-PC package is downright stingy. We'd want to check why the anti-theft feature places us in South Yorkshire, too. ☒ **Simon Williams**

Free

Contact
■ apple.com/uk
Read more
■ tinyurl.com/kxr2qrk

System requirements
iPhone 4s, 5, 5s, 6 and 6 Plus; iPod touch fifth generation; iPad 2, iPad with Retina Display, iPad Air, iPad mini, iPad mini with Retina Display

PC ADVISOR
GOLD

OPERATING SYSTEM

Apple iOS 8

Unlike iOS 7 which brought some major visual changes to Apple's mobile operating system, iOS 8 is really just a series of tweaks and additions that make it even better than before.

Let's start with some of iOS 8's best new features, including notifications, the improved camera app and the QuickType keyboard.

Notifications

Notifications are now interactive, so you don't have to switch apps to reply to a text message, for example. When a notification pops up, it will look the same as before, but you can drag it down to reveal options such as accepting a meeting invite, or a text box to type a reply.

Camera app

This has gained a couple of extra features including a self-timer option at the top, offering a three- or 10-second delay. There's also a brand new time-lapse mode, which automatically chooses a suitable interval time between frames based on what you're shooting.

A more useful everyday tool is the capability to adjust exposure manually. This is tied to the tap-to-focus feature: you tap and then drag a sun icon up or down to change the exposure. The app also supports extensions, so developers can add new filters and potentially other functions, so we'll have to wait and see what they come up with.

QuickType keyboard

When typing, the new QuickType feature suggests words, which you can tap on to add them to your sentence. This isn't based only on the word you're typing: it also predicts what you might type next. It's surprisingly effective and on occasions correctly predicts a string of words, allowing you to simply tap on each to quickly build up a sentence. You can swipe downwards on the suggestions to hide them, and swipe up to reveal them again.

Predictions are context aware, so you'll see different words depending on the app. In Mail, you'll get more formal suggestions while in Messages, the words tend towards more casual speech.

Apple has also opened up the keyboard to developers, so you'll soon be able to download different keyboards – as you can with Android – and get Swype-style capabilities for typing by swiping. SwiftKey is available to download now.

Little tweaks

Throughout the operating system you'll notice small differences that make your life that bit easier. For example, when in the Mail app, you can now swipe across the screen to quickly delete or archive a message instead of having to tap the delete or archive button. Swiping right instead of left marks a message as read (or unread if you've already opened it). Plus, a new Flag option means you can quickly mark an email without opening it.

The action button is more useful than before, allowing you to share things via even more apps thanks to the fact this is another area where Apple has allowed developers in.

In fact it isn't fair to include these 'extensions' in the little tweaks section, but this new feature means apps can share information with each other in iOS 8 rather than having to run in its own little isolated world. It's more than simply sharing a photo to Facebook or Twitter: it means is that you can have widgets in Notification Centre and that you'll see extra extensions appear in the sharing menu in lots of apps.

They're customisable, too. When you scroll to the end of the 'activities' list, a More... option lets

you change the order so you can get to your most-used actions without scrolling. The same is true of the list of apps, and you can also turn off certain options so they don't appear in the list at all. So if you don't use Flickr, there's no need to have that cluttering up the list.

Double-tapping the Home button in iOS 8 still brings up the multitasking screen, but you'll see recent contacts as well as apps. Tap on a face and you'll get various options such as calling them, sending a message or using FaceTime. It makes it a bit faster to keep in touch with people you speak to often.

Siri is much the same as before, but can now identify music that's playing thanks to a tie-in with Shazam. Usually, you'll also see a Buy button so you can purchase it from iTunes. (You can see what Apple did there. Clever.)

Settings have grown, and there's a new battery usage menu that shows which apps are eating up your power. This is great for working out why your battery is draining, rather than killing all the apps and using a process of deduction.

It's a shame, though, that there's still no way to search for a specific setting, even using the new Spotlight search. Instead of the 'Search this iPhone' box when you drag downwards on a home screen, you now see Spotlight Search which also searches the web and Wikipedia, depending on your query: it's context aware. Given the sheer number of settings in iOS 8, it's a pain that Spotlight doesn't cover them as well.

Continuity

If you also own a Mac, you'll benefit even more from iOS 8. Handoff is a feature that allows you to start a task and continue on your Mac, running Yosemite or later. This could be an email or a document or something else. Developers can also use Handoff, so it won't only be Apple apps which have this.

You'll also get text messages appear as notifications on your Mac, and even answer phone calls – or make them, as long as your iPhone is within Wi-Fi range, of course. If you're somewhere without a router, the two devices can use Wi-Fi direct to communicate.

Family sharing

Until now, you've been allowed to install purchased apps on the whole family's devices. With iOS 8, you get Family Sharing. Someone – typically a parent – can invite up to four other people to share an account so any purchases from iTunes or the App Store are paid from one card.

This is almost the opposite way that Google does user accounts. With Family Sharing, each person has their own iPhone, iPad or iPod touch, and restrictions can be put in place for allowed content for children under 13. You can set it up so that they must get the owner's approval before they're allowed to purchase anything. This works for in-app purchases, too, helping you to control costs.

Family sharing also means that everything purchased by anyone is immediately available to download to everyone's device, subject to content restrictions of course. As before, you can set apps and other media to automatically download or prevent that.

The final element is a shared family calendar, to which anyone can add an event and view everything.

Messages

Messages has been given some new features – some of which you may have seen in rival messaging apps, notably Whatsapp. One is the ability to hold the new microphone icon to record a quick voice message, then swipe upwards to send it. You can also record a video and swipe upwards to send that to a friend.

Apple has also integrated Find My Friends. There's a new Details button at the top, which brings up new options. You can send your current location, which inserts a map, as well as choosing how long to share your current location. The Details screen also shows a list of recent attachments from the contact including photos and videos.

It's also easier to manage group messages, as you can name them and add or remove contacts from the thread. You can also mute individuals so you don't get notifications when they reply.

Photos app

There are some big tweaks to the Photos app including a new editing option which has a dial icon. Tap it and you get three new options: Light, Colour and B&W. You can tap each to get a slider and adjust the image. Tapping the list icon gives you even more options, such as the Saturation, Contrast and Cast options within Colour.

In iOS 8, you have much finer control over rotating images and an Auto option will try and straighten your image with just one tap. All edits are non-destructive, which is why there's now a yellow Done button instead of Save. You can return

to your edited photo at any time and there will be a red Revert button, which allows you to go back to the original.

You'll also notice two new albums: Recently Added and Recently Deleted. The latter is like a Recycle Bin which keeps deleted photos for 30 days, just in case you didn't mean to delete them. You have the option to recover individual shots or recover them all. If your goal was to free up storage space, you can hit the Delete all button - an action which can't be undone.

Better still, you can search your photos by date, place or album name, which is much faster than scrolling through hundreds of them.

iCloud Drive

The new iCloud Drive works like traditional cloud storage where you choose which files to put in iCloud Drive. Before, iCloud automatically synchronised only certain data and you couldn't get at specific files, photos or videos as you can with Dropbox, for example.

There's no iCloud app, but when you're in an app that supports iCloud Drive, you'll be able to see the contents of your drive with a familiar folders and files view.

Plus, there's the new iCloud Photo Library. This goes beyond My Photo Stream (which still exists) and lets you store and access your entire photo – and video – library in iCloud. Previously, there was no way to automatically send videos to iCloud so you could view them on other devices. Now there is, and that's very good news.

The not so good news is that you have to pay for it. Yes you get 5GB for free and yes the cost per GB is much lower than last year, but photos and videos now count against the 5GB and 5GB isn't going to be enough to back up even the smallest capacity iPhone.

Health app

A brand new app for iOS 8, Health integrates fitness and health information into one place. It's early days so we haven't been able to test out the Health app yet. We do know it will be able to import data from certain activity trackers, such as the Nike Fuelband, and heart rate monitors.

It will also work with health apps and help you track your health and fitness, monitor your cholesterol, vitamin intake and much more. You can also create an emergency 'card' with vital information about allergies, blood type, current medications and anything else that emergency services might need.

You can choose what information to share (or not) and everything is encrypted when you phone is locked.

Security

To thieves, iPhones are the most valuable smartphones, and are therefore more likely to be stolen. The police know this, and Apple knows this. Therefore in iOS 8, security has been beefed up even more than in iOS 7, making a stolen iPhone pretty much unusable. That's why it's important to avoid skipping over steps during setup when you get a new phone.

When you restart an iPhone running iOS 8, Control Centre and Notification Centre won't work until you unlock it (and neither will Siri, if you've set it to be available on the lock screen), and this prevents anyone enabling flight mode if they steal your phone, turn it off and then back on again later.

Extensions are similar to Android's intents where you're asked which app you want to use to accomplish a task. However, Apple claims to have made this a lot more secure. Rather than the whole app running, a 'stub' is used to carry out the task – such as posting to LinkedIn – and apps can't share data.

Privacy is critical, too, and iOS 8 now warns you when an app has been using your location in the background, and offers to take you to Settings where you can prevent that happening, or allow it to continue.

Verdict

With all the new features, extra security and privacy, and the fact it's free, getting the update is a no-brainer. Download it as soon as Apple's servers will allow.

The only exception is if you're an iPhone 4s owner (and there are a lot of you). Performance on the 4s is an unknown, but going by past iOS updates, the oldest supported devices tend to be slower as they struggle to cope with the extra demands. We're not saying you shouldn't update, but it's well worth holding on as long as it takes for others to report back on whether iOS 8 runs smoothly or not.

We tested iOS 8 on an iPhone 5c over the past few months and even though we were using beta versions, there was never an issue with performance – it runs at least as well as iOS 7. That means anyone with an iPhone 5, 5c or 5s should have no speed issues and is pretty safe to update immediately. **Jim Martin**

GAME

Grid: Autosport

PC ADVISOR RECOMMENDED

£25 inc VAT

Contact
■ codemasters.com/uk
Read more
■ tinyurl.com/Lk35d9j

System requirements
Windows Vista/7/8; 2.4GHz Intel Core 2 Duo or AMD Athlon X2 5400+; 2GB RAM; 15GB drive space; Intel HD 3000/AMD HD 2000/nVidia GeForce 8000 graphics; DirectX-compatible soundcard; broadband internet connection

★★★★½

The original Grid was a fantastic PC racer, but Codemasters dropped the ball with Grid 2. With Autosport the team has gone back to its roots, producing a racer that will appeal to both the loyal fans and new players.

Within a few minutes of firing up Autosport, it's easy to strike off the list a few of Grid 2's problems. There's no inane series of cut scenes that attempt to create a story between races. The focus is squarely on racing and getting down to it with as few distractions as possible.

And pretty much the minute you start racing, you know that the handling- and physics issues have been sorted.

In Autosport the focus is on the single-player career mode. You're a driver for hire, picking from team offers at the start of each season.

There are five basic disciplines: Touring cars, Endurance, Open Wheel, Street and Tuner. Within each are various classes of cars and racing styles. For example, within Tuner there are drift events, time attack and standard races.

In career mode you don't get to build up a collection of cars, but that's no bad thing. The variety of cars is immense, so it's a pleasure to drive whatever you're handed for each season. In special 'Cup' events you get to drive a different car, including classics such as the Mini and Lancia Delta Integrale.

As well as the dedicated racing cars, you can also drive production performance cars, hypercars, endurance prototypes and mods.

There are 22 tracks with more than 100 route variations, but only Brands Hatch in the UK. Not all are circuits, and many are street tracks with unforgiving crash barriers and tight turns. The 'real' circuits are modelled so faithfully that even the most pedantic motorsport fanatics should be happy.

There's hardly any delay between races, allowing you to get racing without bothering with any setup, practice or qualifying, if that's what you want. However, there's also an easy tuning mode with basic sliders for configuring your car's suspension, gear ratios, brake bias and so on. The changes do make a difference, and each car really does drive and handle differently.

Second chance

You'll want to turn up the difficulty to earn more XP, since you'll be rewarded for disabling driving aids and the number of flashbacks you're allowed. Flashbacks are one of our favourite features in Codemasters' racing games, letting you rewind the race by a few seconds so you can avoid silly mistakes that would otherwise cost you the race.

You can alter the AI difficulty as you'd expect, with even the medium level proving challenging when you're driving using the returning in-car view and manual gears. The AI is another step up, with drivers much more aggressive in touring car races than in the open-wheel events, and where contact is almost certain to end in disaster.

There are two in-car cameras, but the dashboard representation is disappointing. You can turn off the HUD entirely to earn more XP rewards, but that means you can't rely on the instruments when using the in-car views.

Too much damage can lead to a puncture and put you out of the race. A more common occurrence is spinouts, and there are often crashes at the first corner.

Graphics and sound are excellent, and it's the small touches such as being able to hear the commentators over the track Tannoy that makes Grid even more immersive. The repetitive phrases heard over the team radio quickly wear thin, though.

With the graphics set to Ultra things look fantastic, but you'll need a powerful PC to maintain smooth framerates. Heat haze, dynamic lighting and weather, day and night races and more make Grid: Autosport one of the best-looking racers around. There's also support for a second screen, which shows a 'TV feed' as you race, along with the current standings and positions of the cars on the circuit.

Multiplayer options include the increasingly rare two-player split-screen mode, plus loads of online modes. Party modes include Demolition Derby and elimination, while online multiplayer includes weekly challenges and even a club mode where you can join a team and race against other clubs.

It's online where you can build up a collection of cars, which must be maintained – each has an odometer that shows how many miles it's raced. You can buy brand-new or secondhand, with each car having its own 'XP' and being upgradable with various go-faster goodies. It's also possible to design your own livery.

Verdict

Grid: Autosport is a racing game with longevity. You'll undoubtedly find you favour one or two disciplines over the others, but there's plenty here to keep you coming back for more. ☒ **Jim Martin**

$99 + $26 shipping (£77)

Contact
- playosmo.com

Read more
- tinyurl.com/L93d4qe

System requirements
Compatible with iPad 2/3/4, iPad mini/mini Retina and iPad Air

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

★★★★½

GAMING PLATFORM

Osmo for iPad

Osmo is a fun and educational gaming platform for kids. It's a simple idea done brilliantly well, and will appeal to parents who prefer their children to be a bit more active with their iPad games.

It's a combination of hardware and apps that bring to life the iPad in a way that most app-only games can't match. Instead of swiping and tapping players draw (on paper), pick up and throw (real) letter tiles, and fit together geometric shapes (also real) to create picture puzzles.

Osmo is aimed at children aged six- to 12 but it's just as much fun for adults, and younger kids can have fun, too.

Osmo consists of a base unit into which you slot the iPad, plus a plastic mirror cap that fits over the iPad's camera so it can 'see' what's happening on the table below. It's a neat idea that has lots of potential.

It's super-easy to set up, and this simplicity hides what is really a great idea for transforming the iPad into something new. It pushes the virtual world of apps back into the real world of children's games.

It's all done with a small mirror that deflects the iPad's camera to the playing area – no Bluetooth, charging or Internet required.

Osmo comes with three games: Words, Tangram and Newton.

Words

Words is an app that is combined with two packs of letter tiles. There are red- and blue sets for competitive or team games. You could also play the game on your own, but the real fun is in the competition. This is one for the whole family to enjoy.

The screen shows a photo and you have to spell out the word it represents by placing the letter tiles in front of the iPad for Osmo to see.

The challenges get harder as the game progresses, and the words to find get more subtle – although rarely out of a child's vocabulary.

If you keep making mistakes or have trouble thinking of the words, the game lowers the difficulty level.

Words encourages looking and thinking, with some spelling practice thrown in, too. It's a lot of fun.

If parents could add their kids' school spelling lists into the mix – maybe with audio rather than photo images – Words would be worth the whole Osmo price on its own.

Tangram

Tangram is an ancient Chinese game that has you making geometric pictures out of flat shapes. It's another example of Osmo's physical- and visual strengths. Osmo shows you a pattern and you recreate it using the supplied shapes.

Tangram is relaxing and pushes the player into concentrating and moving the puzzle shapes with their hands. It's a very Montessori approach, and quite calming (when you get it right).

Newton

Newton doesn't come with a box and pieces like Words and Tangram. All you need is the app, some paper and a pen or pencil. Scrap that... you need a lot of paper. If you really get into Newton you'd be wise to buy a small whiteboard to play with.

Newton drops virtual balls from the top of the iPad screen, and you control their fall – by drawing lines or placing objects in their way – so that they hit the desired targets.

Newton is another visual/physical game – with added audio as the balls hit the virtual surfaces – that requires more focus and thought than most kids' iPad games. There are 60 levels to complete.

UK price and availability

Tangible Play is a new company, and as such the game is currently available only by pre-order.

Osmo costs $99, while international shipping adds $26 – together it works out around £77. If Osmo will also appeal to your children's friends you could cut shipping costs by ordering more than one unit – shipping an extra unit to the UK costs just $10 more.

Verdict

Osmo is a fantastic new type of gaming on the iPad. It's physical and stretches a child's mind while also being fun. Parents are rightly concerned about the amount of screen time their children spend in front of the TV, computer, smartphone and tablets. Osmo uses the iPad less for its screen than its ability to let children interact physically in front of it. Indeed, the iPad's screen seems secondary to Osmo's playing pieces. It's a game that will be enjoyed by the entire family. ☒ **Simon Jary**

INKJET PRINTER

Canon Maxify MB2050

£132 ex VAT
£159 inc VAT

Contact
■ canon.co.uk
Read more
■ tinyurl.com/oo3nx79

Specification
Four-colour (CMYK) A4 inkjet printer; 1200x600dpi print resolution; 1200x1200dpi scanner; 300x300dpi fax; rated speed – 16/11ppm for mono/colour; 1x USB interface; 802.11n Wi-Fi; 250-sheet input tray; 463x459x260mm; 10.7kg

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

★★★★☆

Improvements in speed, quality and running costs mean that inkjet printers can now provide real competition for laser printers in the business market, and Canon is the latest manufacturer to introduce a new range of inkjet printers aimed at business users.

The Maxify range is designed for smaller businesses and people who work from home, and prices start at just £159 for the MB2050 we review here. It's not as compact as Canon claims, as it measures a rather chunky 260x463x459mm, so it will need a small table or desk devoted to it. However, it performs well for the price, and crams in most of the features that small businesses users are likely to need.

As well as 1200x600dpi printing, the MB2050 includes a 1200x1200dpi scanner and copier, and 300x300dpi fax machine. The paper input tray holds 250 sheets of paper, and the printer's duty cycle is rated at 1,000 pages a month, which should be more than adequate for most small businesses. There's a 50-sheet document feeder, automatic duplex printing, and both USB and Wi-Fi connectivity.

It supports Apple's AirPrint for printing from iOS devices such as the iPhone or iPad, along with Google CloudPrint, and Canon's own 'scan to cloud' option, which allows you to scan documents and upload them directly to cloud services such as Dropbox or Evernote. The only thing missing here is an ethernet interface for wired networks.

Canon rates the MB2050 at 16 pages per minute (ppm) for mono printing and 11ppm for colour. Our tests produced figures of 14ppm when printing simple text documents with Microsoft Word, and a more modest 8ppm with PDF files that contained text and colour graphics. Even so, those figures are still respectable for a printer in this price range, and the MB2050 seems like a good choice for people who work at home or in a small office.

Print quality is very good too, with sharp black text that genuinely rivals laser quality. It can even produce good photo output, even though the MB2050 only uses the four standard CMYK inks – cyan, magenta, yellow and black – rather than the five or six inks that Canon employs in some of its specialist photo printers. A full A4-size photo took just 18 seconds to print on plain paper, and showed no signs of the banding and striping that often afflicts inkjet printers. The colours were rather dark, though, so we also printed the same image using more expensive glossy photo paper. The results here were extremely good, with much more vivid colours and lighter skin tones. The print time increased to a full two minutes when using glossy paper, but that's not unusually slow and the MB2050 can certainly be used to print product photos, fliers and marketing brochures from time to time.

The 'setup' cartridges provided with the MB2050 last for only 400 pages for mono printing, or 300 pages for colour, and after that you'll need to buy your own replacements. Canon's XL cartridges provide 1200 mono pages or 900 for colour. You can't buy them directly from Canon, though, and online prices seem to vary enormously. The lowest prices we could find put all four cartridges at £14 each, which comes to 1.2p per page for mono and 4.6p for colour. Those are good prices, but we also saw the same cartridges selling for more than twice as much on some sites, so you need to shop around.

Verdict

The monolithic appearance of the Canon Maxify MB2050 isn't going to win any awards for elegant design, but it does provide a good, affordable workhorse printer. The lack of an ethernet interface may deter some, but its speed, quality and running costs will appeal to many people – just as long as you shop around for replacement ink cartridges. ☒ **Cliff Joseph**

PROJECTOR

InFocus IN126STa

£458 ex VAT
£550 inc VAT

Contact
■ infocus.com
Read more
■ tinyurl.com/nhh3qpb

Specification
DLP technology; 1280x800 (WXGA) native resolution; 3300 ANSI lumen (3000 eco mode); 15,000:1 specified contrast ratio; 32dB (30dB eco mode) acoustic noise; HDMI 1.4, 2x D-Sub; composite video; S-Video; USB; audio out; ethernet; 278W power consumption; up to 3500 hours claimed lamp life (500 hours eco mode); 292x108x220mm; 3.7kg

Build:
Features:
Performance:
Value:

Whether in a classroom or a meeting room, being able to project a large and clear image is one of the key requirements in creating a big impression. With that in mind, a short-throw lens projector is a great solution for modest classrooms and cramped offices.

Models like this InFocus IN126STa can cast a much larger picture while positioned only a small distance from the wall, so you won't be stuck with a small image when you lack space to get optimum screen size.

With a throw ratio of 0.52, the InFocus IN126STa can project a 100in image while positioned just 1.1m from the screen. In contrast, its more standard brother, the IN126a, needs a minimum of 3.2m in order to create the same image. Meanwhile, the IN126STa can get close to projecting a 300in-wide image from that distance. So, on paper at least, the IN126STa is a great choice for projecting in confined spaces. But is it any good?

It's hardly the most elegant projector to look at. With its blocky casing, it's almost as though this projector has fallen out of a time warp. At 3.7kg, it can be lugged from one room to another, but it's hardly the lightest of projectors – if you need a model you can carry over significant distances, this clearly won't be your choice.

The 3300 ANSI lumen brightness rating is decent, if just below the 3500 ANSI lumen of the regular IN126a. It's notable, though, that the NEC M352WS (tinyurl.com/q6j2n6w) – which, like the 126STa, has a short-throw lens – advertises 3500 ANSI lumens as well.

In truth, those extra 200 ANSI lumens are unlikely to make much difference, and 3300 will be enough for this model to create a clear image even in a relatively light room.

The 1280x800-pixel (WXGA) native resolution support is perfectly adequate for the business user. So you can't get full-HD resolution from this model, but that is partly reflected in its lower price.

LAN networking is offered as standard, and for around £30 extra you can add Wi-Fi networking as well. This opens up the connectivity options, allowing the projector to draw source material from services such as Dropbox, or from mobile phones. Even in standard trim, it can use content that has been stored on USB devices, or written into the 2GB of internal storage.

Interactive features can be added through the optional LiteBoard Adapter, and it's also possible to get a LiteBoard Wand, effectively a pointing stick that is designed to let you draw on the projected image itself.

The Wand is currently difficult to find in the UK, but has potential to be a very flexible and useful aid during classes or presentations.

You can achieve many of the same aids, if in a rather less slick fashion, by using the free EZ Display app to add multi-colour annotations to your documents. Like most modern projectors, stereoscopic 3D images can be viewed after the purchase of suitable glasses.

The InFocus IN126STa is a cheaper model than the NEC M352WS we tested recently. Unsurprisingly, then, the image quality isn't as good. It makes a strong job of displaying text and figures, although its colour scheme is a little pale when projecting high-detail video. The picture wasn't totally smooth, and there were also signs of flicker.

And this being a budget DLP projector, there was more evidence of the rainbow effect than on more expensive models.

For classroom and business work, the rainbow effect is less likely to be annoying than when watching a film, but it's a mark against it if you're thinking of using the projector for lots of videos.

Verdict

For the money, this is a very proficient projector. The short-throw lens is useful, the brightness level sufficient for daylight conditions, and the features are good – with some excellent options available that can turn it into a very powerful device. If you want better quality, and a marginally bigger image, the NEC W352WS is the superior buy. But then, that model will set you back around £200 more. At this price-point, the InFocus IN126STa takes some beating as a short-throw lens business projector. ☒ **Martyn Clayden**

FOUR-BAY NAS DRIVE

Synology RS814RP+

£800 ex VAT
£1,000 inc VAT

Contact
■ synology.com/en-uk
Read more
■ tinyurl.com/nuo9pbw

Specification
Four-bay rack-mount NAS drive; 2.13GHz Intel Atom D2700; 2GB DDR3 RAM (expandable to 4GB); Synology DSM 5.0-4493 Update 5 operating system; 4x drive bays for 2.5- or 3.5in SATA drives; 4x gigabit ethernet; 2x USB 3.0, 1x eSATA; 2x internal PSUs; D-sub console port; 3x 35mm cooling fans, 2x PSU fans; 430x574x44mm; 7.11kg; 3-year warranty

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

Synology is best known for its desktop network-attached storage (NAS) boxes, versatile storage products for small businesses and home power users. Less familiar may be its range of rack-mount storage servers, aimed at larger businesses that may already have racks populating their server rooms.

The basic RS814 takes an ARM processor from Marvell, a 1.33GHz dual-core Armada XP chip, and includes 1GB of memory. The '+' models have 2.13GHz Intel Atom processors, the long-running D2700 variant that has been in the company's top multi-bay desktop NAS drives for the past two years. We were loaned the RP variant, which has a second, redundant power supply, designed to instantly step up if the first should fail in use.

The RS814RP+ is a 1U-high rack-mount file server, measuring 430x574mm, and is a solidly constructed all-metal unit.

Its disks are mounted flat, four across the width of the chassis, in removable bays which can be hot-swapped with the unit running. These are removed by levers and can be secured against accidental removal by a splined hex key.

Rack-mount finger pulls are included for optional attachment, while a rail kit is available at extra cost (RKS1314, around £60) to allow the entire unit to be easily slide out from inside cabinet.

Build quality is very high, with important maintenance features you'd expect of a professional high-availability design. The self-contained and individually fan-cooled power supplies can be slid out and replaced after simply pushing a lever, while the main motherboard with supporting electronics also slides out the back after loosening two thumbscrews. This can then be replaced in seconds if required for minimum downtime in event of failure, assuming you have a spare on standby.

Currently at version 5.0-4493, the Linux-based DSM operating system received an overhaul of its graphical interface earlier this year, so it now aligns it closer to the look of Windows 8 and iOS 7.

Particularly for a professional product, this lurid-meets-pastel tribute to Microsoft and Apple's user interface design trend looks misplaced on a pro device. But it's arguably the most consistent and beautifully rendered NAS admin interface on the market today.

Beyond its technicolour square-cornered skin, it's eminently usable, providing easy access to the key features and parameters that a company sysadmin may need, without falling back to a CLI console. There is still an option, of course, for logging in via SSH.

The listed feature set for business users is comprehensive. For Windows-reliant workplaces there's Windows ADS integration, and Windows ACL is said to be applied across all access entries. For running virtual servers, the unit is certified compliant with VMware vSphere, Citrix and Microsoft Hyper-V virtualisation services. Enabling faster data access is the DSM's support of iSCSI with SMB.

Thanks to four gigabit ethernet ports, it's possible to configure the unit for NIC failover redundancy, or for link aggregation to bust a single gigabit LAN's limited throughput. Synology advertises 330MB/s reads and 196MB/s writes – over SMB in Windows with a RAID 5 array – with the help of such multiple port setups.

For system memory, the RS814RP+ includes 2GB as standard, upgradable with a second SO-DIMM card to 4GB total. Note that the use of a budget Atom processor means ECC memory is not an option.

Performance

We tested the RS814RP+ after loading it with four 3TB Seagate Barracuda 3.5in SATA disks. These were configured in RAID 5, leaving a total usable capacity of 8.11TB. Tests were run in Windows and OS X using SMB and AFP network protocols over a single gigabit LAN connection.

Using CrystalDiskMark in Windows 7, we measured both sequential reads and writes at about 107MB/s. We would expect this was limited more by the gigabit interface and gigabit router. At the smaller 512kB-file level, the NAS was still operating at 98- and 101MB/s for reads and writes respectively. And with 4kB random data, both reads and writes measured a decent 10MB/s.

We tested sequential and random read/write speeds in OS X, initially using the standard AFP connection for Macs. Over the same router and test network, speeds recorded by QuickBench averaged 112- and 111MB/s respectively for large sequential transfers.

Sluggish small-file transfers have improved greatly with Synology's latest implementation of AFP, now measured at 14.1- and 6.6MB/s for random 4kB reads and writes. When averaged with files from 4- to 1024kB size, the overall figures returned were 62- and 53MB/s.

Connecting the Mac using Apple's SMB2 protocol in OS X Mavericks, we saw large sequential read average 109MB/s while sequential writes averaged 102MB/s.

As important for good all-round performance, small-file transfers remained quite speedy here at 63- and 51MB/s, averaged with the same 4- to 1024kB random file set.

System power consumption was harder to gauge. The RS814RP+ seems to demand that both power cables are connected at all times, else a continuous high-pitched piercing alarm will sound. But it seemed both PSUs were in constant use, as we measured 29W draw from one and 35W from the other, by alternating our single mains power meter between reboots.

The 35W idle figure on the left-hand PSU rose to 38W with the NAS under a multiple file copy/read/write load, fitted with the same four low-power Seagate Barracuda disks.

Verdict

Synology's RS814RP+ is a relatively low-cost alternative solution for modest four-bay rack-mount NAS needs. It's still scalable in storage size and offers an approachable admin interface that will be more intuitive for unskilled network administrators. ☒ **Andrew Harrison**

Gaming laptops

If you're an avid gamer, you'll know that a gaming laptop is superior to a console, plus you'll be able to play your favourite games no matter where you are. We look at five of the best

Consoles and tablets may claim to take the gaming crown, but PCs and laptops remain the most powerful and flexible gaming rigs you can buy. Indeed, one analyst recently claimed that sales of dedicated gaming laptops have increased by 50 percent since 2011. This may be from a small base, but there's no doubt that the combination of nVidia GeForce graphics cards and powerful portable CPUs from Intel means that super-fast framerates and spectacular 3D eye-candy is no longer tied to the desktop.

Indeed, given the lack of clutter and the space-saving capabilities of gaming laptops, we would recommend them to any serious gamer. The only real downside is that unlike a desktop PC, you can't easily upgrade. But upgrade you can, and that, combined with the ability to also run all normal PC tasks for work and play, makes a gaming computer a lot more valuable than a games console.

Which brings us back to the tech. The latest GPUs from nVidia are faster than ever, and Intel's roll-out of Core-M chips mean that the previous generation of powerful, portable processors are dropping in price. All this means that a dedicated gaming laptop can be yours regardless of the budget to which you are tied. You do get what you pay for, however. High-end laptops with true gaming potential we've reviewed in the past typically cost £1,500 to £2,000 – and you can certainly still spend that sort of money on a top-of-the-range gaming rig and get value.

However, as we discovered, it's now possible to get respectable gaming performance from more mid-range machines in the £1,000 to £1,500 category. There's no compromise here: we are talking about true dedicated gaming rigs offering high-end framerates, at something approaching an affordable price. And as the CPUs and GPUs improve, we are starting to see gaming laptop makers focus more on energy-efficiency and portability. Traditionally, they've 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, but even the 17in monsters are becoming more portable. And better power efficiency means it's even 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 comfortably into a backpack.

There's now greater choice than ever before in the gaming market. And you don't need to compromise to squeeze a gaming PC into a laptop chassis. Here's our round-up of the latest and greatest gaming laptops for every budget.

Photography by Dominik Tomaszewski

AORUS X7 V2

£1,725 inc VAT • aorus.com

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

PC ADVISOR BEST BUY

How's this for a gamer's dream. If there's one thing better than a decent graphics processor in a laptop, it's got to be two very decent graphics processors in the same machine. That's what the Aorus X7 v2 offers, a pair of nVidia GeForce GTX 860M GPUs, arranged to work in unison in nVidia's scalable link interface (SLI) configuration.

Aorus, a sub-brand of Gigabyte, isn't the first laptop maker to try this trick on a gaming notebook, of course. What is remarkable is how it's done so in a relatively thin chassis. The X7 v2 is just under 25mm thick, which in laptop gaming circles makes it practically a MacBook Air. It's no lightweight though, thanks to an all-aluminium metal body and a big 17in display. Ignore Aorus's claim of 3kg weight – this 425mm-wide beast weighs 3.24kg, plus another 965g for the 200W mains charger, making an effective all-up weight of 4.2kg.

Finding a Windows laptop with entirely metal construction is almost unheard of, and the choice of aluminium is good for sinking away the unavoidable outpouring of heat that two GPUs and a quad-core CPU create. Two cooling fans inside draw in and expel air over a series of internal heatpipes and sinks, although we did find that the fans would ramp up to annoyingly loud levels for no good reason, seemingly randomly, with the laptop just left idling on the desk.

The X7 v2 comes with faster 1867MHz memory in place of 1600MHz, a surfeit of 16GB of it in our sample, and has found space to accommodate not three but four internal storage drives. For bulk storage, it can accept a single 2.5in SATA hard drive – our sample included a 1TB disk – while three 128GB mSATA SSDs from Lite-On were configured in RAID 0 to give a speedy 367GB boot drive.

On processor duties is now an Intel Core i7-4860HQ, a 2.4GHz quad-core chip with plenty of power for a machine that will rely more on its graphics horsepower to win friends. Combined with the fast storage setup, this combination allowed the Aorus to romp in with 6304 points overall in the PCMark 7 system benchmark test – the highest scoring laptop we've tested.

The laptop's screen is superficially impressive, a 17.3in TN panel with matt finish for easy glare-free viewing. Look closer, though, and you may see a fine vertical grain structure than we found a little unsettling. Viewing angles side-to-side are very good, not far from a high-quality IPS panel; but viewed from below you get the unmistakable negatised colour reversal of a TN screen.

We found the trackpad unusual, a shiny buttonless surface somewhat similar to Apple's peerless glass trackpads, although this version's plastic finish made finger movements stickier. We've no complaints about the keyboard, though, a typical Scrabble-tile construction with easy action and backlit keys.

We gave the Aorus a workout with a couple of games. In our Stalker: Call of Pripyat test, it scored 189fps on the Medium setting and 157fps on Ultra. In Tomb Raider, the Aorus excelled, averaging a healthy 88fps at Normal detail, dropping to 57fps at High, but still an impressive 43fps with all the stops out at Ultimate quality.

Battery life from the non-removable 75Wh lithium-polymer battery was rather brief at 1 hour, 48 minutes.

VERDICT: The Aorus X7 v2 is a sturdily made all-metal gaming laptop that keeps its waistline to around 1in, even if it still tips the scales beyond 3kg. With its dual-GPU setup it proved itself the fastest gaming laptop in the group, albeit with an unsurprising price premium.

ASUS G550JK

£1,099 inc VAT • asus.com/uk • tinyurl.com/mdo32aw

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

There's been a shift in gaming laptops, with bulky, expensive systems being challenged by leaner, cheaper laptops. The Asus G550JK is the latest to impress, thanks to a good-looking chassis and full-HD screen. The black aluminium body is highlighted with red, from the backlit keyboard and crimson letters to the glowing logo and buttons. The Asus looks better than uninspired, plastic rivals, and its build quality impresses: the base and wrist-rest barely budged, and the screen's slight movement didn't translate into desktop distortion.

It weighs 2.6kg and is 27.7mm thick, so it's lighter and thinner than the Schenker XMG P504 (tinyurl.com/qh3wmkq) and Scan's 3XS Graphite LG156 (tinyurl.com/mytg9x5). From the recent releases, only the Gigabyte P35W v2 (tinyurl.com/o9wuf8s) does better.

The keyboard is a Scrabble-tile unit that benefits from the design – the keys are light with modest travel, but the solid base provides good feedback. The touchpad is good, too. It's large and smooth, and we zipped around during gameplay. It's not without issues, though. The numberpad's keys are too slim, and the touchpad's buttons are tricky to press in each corner, where more pressure is required.

The Asus is powered by a mid-range nVidia GeForce GTX 850M graphics processor with 2GB of memory. On paper, it can't keep up with rivals, although it's given a hand by Asus' overclocking, which raises the clock a few percent from 936- to 991MHz.

Only the toughest games gave the Asus trouble. It handled Stalker: Call of Pripyat at every quality level, and ran Tomb Raider at Ultra-quality at a smooth 32fps. It slowed to 20fps at Ultimate detail level, though. The G550JK handled Batman: Arkham City's higher quality settings at 43fps, and only slipped to an unplayable 24fps when the anti-aliasing was turned to full.

The Intel Core i7-4700HQ is clocked to 2.4GHz across four hyper-threading cores. The Asus' PCMark 7 score of 3833 points isn't great, though – every rival is quicker. Temperature remained stable and noise remained relatively low during every test. However, battery life disappointed; in the looping video benchmark, the G550JK lasted for three hours, 19 minutes, and for around an hour when playing games.

There's 16GB of RAM and a Blu-ray drive, but no SSD, just a 1TB hard drive. There are three USB 3.0 ports, HDMI and Mini DisplayPort connectors and an SDXC card slot. For network connections there's gigabit ethernet, Bluetooth 4.0 and 2x2 MIMO 802.11ac Wi-Fi.

The 15.6in screen has a 1920x1080 resolution, which is good for gaming and general use. The matt finish also works well at banishing reflections. It's IPS, so the viewing angles are good, with only a tiny deficit in brightness if the screen is viewed from above or below.

The great 962:1 contrast ratio is formed from superb brightness and black levels, and means deep blacks and bright, vivid colours. Issues were minor – barely detectable banding across gradients and marginal black-level crushing. The screen handled much of the more limited sRGB gamut, with a coverage level of 93.1 percent and a fantastic average Delta E of 1.91. Only a handful of red and pink shades weren't rendered properly.

We can't lavish similar praise on the speakers, though. Volume is fine, but quality is lacking throughout.

VERDICT: The Asus G550JK is a smart machine with a great screen and comfortable keyboard, though, the focus on design means more gaming grunt is available elsewhere for less. If, however, your budget is tight, it's still a good choice.

CHILLBLAST HELIX

£1,250 inc VAT • chillblast.com • tinyurl.com/q8u7cup

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

PC ADVISOR RECOMMENDED

Gaming laptops are often built like tanks, but when nVidia unveiled its GTX 800M series of graphics processors earlier this year, it promised that the power-efficient chips would make it possible to develop a new generation of slimmer, lighter gaming systems. It's taken a while for these new laptops to surface, but following Gigabyte's impressive P35W v2 (tinyurl.com/o9wuf8s), we now have a few relatively sleek gaming laptops including the 17in Chillblast Helix.

At 2.66kg, it's a little heavier than its Gigabyte rival (2.5kg), and you certainly won't want to carry it around in a backpack all day. Even so, it's only slightly heavier than many 15in Windows laptops, and its 21.8mm chassis makes it easy to pick up and carry. The slimline design means that Chillblast has jettisoned the DVD drive, so you'll need to find a USB drive if you're installing games from optical disc.

The chassis is nice and sturdy, and provides good support for the 17.3in screen. We also liked the feel of the keyboard, which has a nice, firm action on the keys. Connectivity is good, with four USB 3.0 ports, and two Mini DisplayPort interfaces along with HDMI for connecting to a larger display. There are also separate ports for headphone, microphone and external speakers, although the internal speakers provide plenty of volume and even a fairly respectable bass sound, so you can play games or listen to a few songs without needing to plug in another set of speakers.

We weren't impressed by the screen, though. As we've come to expect, the 17.3in screen provides 1920x1080 resolution, but it's not as bright as we liked and viewing angles taper off noticeably at around 120 degrees. It's adequate for streaming video and web browsing, but we'd hope for greater brightness and contrast from a laptop costing over £1,200.

Battery life was relatively short too, giving us three hours, 45 minutes of streaming video – even when we switched to the less power-hungry integrated HD 4600 graphics.

Crucially, though, the Helix delivers the goods better it comes to speed performance. Our review unit came with a quad-core Intel Core i7 running at 2.5GHz, 8GB memory, nVidia GeForce GTX 870M graphics, and both a 120GB solid-state drive and 1TB hard disk. Ordinarily, that conventional hard drive would be something of a performance bottleneck, but the SSD restores performance considerably, allowing the Helix to restore from suspend in nine seconds when using the Windows 8 fast-start option, and to hit a decent score of 5710 points in the PCMark 7 system benchmark test. But, of course, it's gaming performance that really counts here. And while the GTX 870M used by the Helix isn't quite top-of-the-range it still provides speeds that will satisfy all but the most hard-core gamers. It breezed to 142fps when running our Stalker: Call of Pripyat casual gaming test at native 1920x1080 resolution. We then tried the more demanding Batman: Arkham City test. That game defaults to 1600x900 resolution with DX11 turned off, which produced a smooth 55fps, but turning DX11 on and stepping up to 1920x1080 with all graphics settings on High only caused that score to dip slightly to 50fps.

VERDICT: The Chillblast Helix isn't perfect, and its screen and battery life are adequate rather than impressive. However, it manages to provide high-end performance at a competitive mid-range price, and will appeal to gamers who want a laptop that won't break the bank – or your back.

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PC ADVISOR

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MSI GE70 2PE APACHE PRO

£1,299 inc VAT • uk.msi.com • tinyurl.com/pu5L5gk

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

The GTX 800M series of GPUs from nVidia has given rise to a new generation of slimmer, lighter gaming laptops in recent months. However, the GE70 2PE Apache Pro is a bit of a throwback to the days of the big, heavy gaming beasts once more.

Weighing in at 3kg and measuring 39mm thick, the 17in GE70 certainly isn't very backpack-friendly and will probably spend most of its time at home. The battery doesn't last all that long either, and only just scraped 120 minutes of streaming video even when using its power-efficient Intel HD Graphics 4600 integrated graphics.

Weight and size aside, the GE70 is smartly designed. The black plastic casing isn't particularly elegant, but it's sturdy and provides good support for the 17.3in screen. The keyboard is firm, spacious and comfortable, and it's nice to see a full-size set of arrow keys for a change. The keys themselves have a nice smooth travel action, and we even liked the way that the keyboard backlight displays smoothly graduated colours across the width of the keyboard.

There are a few annoying rough edges, though. The plastic surface of the trackpad feels flimsy and unresponsive, and noticeably bends when you press down on the left/right buttons. Another shortcut is the AC-3160 wireless adaptor, which supports only single-stream Wi-Fi at 433Mb/s, compared to the full 1300Mb/s speed of current draft 802.11ac. However, gamers will tend to prefer a lag-free wired network connection anyway, for which there's a Killer e2200 network adaptor.

And, thankfully, the 1920x1080 resolution TN screen is bright, sharp and colourful. Horizontal viewing angles are close to a full 180 degrees, and there's a matt-finish that reduces glare and reflection for maximum visibility. The vertical viewing angle is more limited, though, so you might need to nudge the screen occasionally to get the brightest possible image. It's not a major flaw but, like the trackpad, it shouldn't be a flaw at all in a laptop as expensive as this.

We couldn't fault the GE70 on performance. Our review unit was priced at £1,299 with a quad-core Intel Core i7 running at 2.5GHz, 16GB of memory and an nVidia GeForce GTX 860M graphics processor. The storage system is pretty impressive too, with a 7200rpm hard drive providing 1TB of storage for all your games, music and videos, while Windows is installed on to a pair of 128GB solid-state drives that are configured as a RAID 0 volume for maximum performance.

Using the Windows 8 fast-start option, the GE70 recovers in just nine seconds and is ready to start launching applications right away. It breezed to a great score of 6241 points when running the general-purpose PCMark 7 benchtest, while scores of 3251 and 3460 points in the Home and Work suites of PCMark 8 were a match for more expensive gaming laptops we've seen costing £1,500 or more.

The GE70 managed 120fps with no trouble at all when running our Stalker casual gaming test, and also performed strongly with the more demanding Batman: Arkham City. That game defaulted here to 1600x900 resolution with DirectX 11 turned off, which produced a score of 54fps. However, stepping up to 1920x1080 and turning DX 11 on, as well as all graphics settings to High, only caused a slight dip to 48fps.

VERDICT: The GE70 2PE delivers the goods when it comes to gaming action. The extravagant storage system lets it squeeze maximum performance out of its processor and GPU, and ensures it provides high-end gaming performance at a mid-range price.

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

MSI GS60 2PE GHOST PRO

£1,317 inc VAT • uk.msi.com • tinyurl.com/jvjbu39

Gaming laptops are shrinking, but few challenge Intel's Ultrabooks for size. The MSI GS60 2PE Ghost Pro manages it with dimensions that scarcely seem believable for a gaming notebook: it's 19.9mm thick and weighs just 1.96kg. The lightweight design is paired with a good-looking exterior that's made from magnesium-lithium alloy. It's finished with a subtle brushed pattern, and the lighting is subtle – a backlit keyboard, a couple of illuminated logos, and that's it.

The 4mm-thin screen bends back and forward easily, and the base's bottom panel feels similarly flimsy. We'd protect the Ghost Pro with a sleeve or case. It's not upgrade friendly, either, with most components underneath the keyboard and difficult to reach.

The keyboard comes from expert firm SteelSeries, and there's a firm base despite the MSI's slim dimensions. The keys hammer down rapidly, which works well during frantic games, and the touchpad is similarly snappy.

Despite the slim chassis, MSI has deployed an nVidia GeForce GTX 870M graphics processor. It's a potent GPU with a 941MHz core, the same hardware used by Chillblast Helix (page 78).

We ran Batman: Arkham City at full-HD with every setting turned to maximum, and the MSI averaged 45fps: ample for smooth play, but 5fps behind the Chillblast. At Tomb Raider's top settings, the MSI averaged 39fps. The easier Stalker benchmarks proved no problem.

The GPU is partnered with a Core i7-4700HQ processor clocked to 2.4GHz with 8GB of memory, and with the fast SSD configuration enabled a score of 5655 points in PC Mark 7.

In our standard streaming video test, it lasted just short of two hours, which isn't as good as most rivals can manage. If you're playing games, expect about an hour of life from its 52Wh lithium battery.

The storage is special: the 237GB boot drive is a RAID 0 array made from two 128GB SSDs connected using the new, fast M.2 standard. It's a performance configuration, so there's no data duplication, but the sequential read speed of 1012MB/s was spectacular, and the 367MB/s sequential write was reasonable.

The MSI has an excellent IPS screen. The 1019:1 contrast ratio was one of the best results we've seen, and the Delta E of 2.16 was good, and helped deliver a wide range of accurate colours. The sRGB gamut coverage is the final tick in this screen's box: at 93.6 percent, it's better than most TN panels.

The matt layer successfully eliminates reflections without a grainy finish, the 1920 x 1080 resolution is just right, and viewing angles are reasonable: excellent from above and below, but merely mediocre from the sides. Only one recent system, the Asus G550JK (page 77), has a better panel – and there's not much to choose between the two.

The MSI even has good audio. The treble is snappy, the midrange churns out good, crunchy sounds, and there's even some bass.

Our biggest issue concerns thermals. The processor's top temperature of 90ºC wasn't far ahead of the graphics card, and the rear of the base panel became too hot to use on a lap.

VERDICT: The MSI GS60 has enough power to handle current games, and it's got the screen quality to match – and all while costing less than the Gigabyte P35W v2 (tinyurl.com/o9wuf8s), which has a poorer screen but a tad more gaming power. The storage, keyboard and speakers all impress, but this slimline machine struggles for longevity and has poor thermal performance. It's thin and impressive, but be aware about the MSI's limitations before spending any cash.

Conclusion

Starting with the cheapest gaming laptop here, the Asus G550JK makes use of an nVidia GTX 850M with 2GB video memory to play challenging games like Batman: Arkham City at decent framerates even at High detail. But push it further with Tomb Raider, for example, and you'll need to rein in the detail a little. Its poor result in the general-purpose PCMark 7 benchmark reflects on this machine's biggest weakness – a slow hard disk for storage. While this won't directly impact game speed, it will make the laptop feel sluggish in normal use when set against anything with an SSD inside.

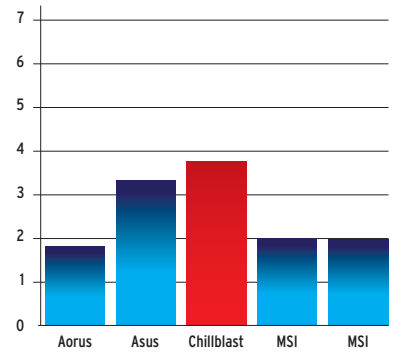
Chillblast's Helix puts plenty of laptop in your hands, including an mSATA SSD for speed and a terabyte disk for bulk storage. Its 2.5GHz Core i7 is ample for most power user needs but it's the extra graphics horsepower that counts here – an nVidia GeForce GTX 870M that lets the Helix stride forward with 50fps in the same Batman High-detail test. It's one of the slimmest gaming machines we've tested, yet it could run for closer to four hours from battery when required.

Two gaming laptops from MSI are separated principally by their screen dimensions – the 15.6in GS60 and 17.3in GS70 were both around £1,300 when we tested them. But look closer and you'll find the smaller GS60 packs the better graphics option of an 870M with 3GB memory, where it's big brother plumps for GPU just below, the 860M with 2GB. The difference can be seen in Batman at Maximum detail, for example, with 45- against 36fps, making the GS60 the choice if you wanted to maximise gaming speed; but if viewing comfort is more important, look to the larger GS70.

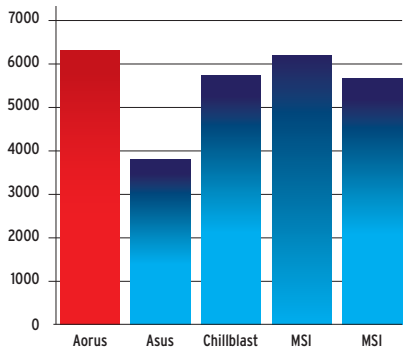
Which leaves the Aorus X7 v2 as the clear leader in gaming performance, thanks to double the graphics engine in the form of the midrange GTX 860M. It's an impressive chassis too, relatively discreet and stealthy in black metal. The added specification features will set you back more than £400 over the nearest price competitor, but if you demand the smoothest gameplay in a portable chassis, this is currently the clear choice.

	AORUS **£1,725 inc VAT (£1,437 ex VAT)** ★★★★½ PC ADVISOR BEST BUY	**ASUS** **£1,099 inc VAT (£915 ex VAT)** ★★★★☆
Model	X7 v2	G550JK
Display	17.3in (1920x1080, 127ppi) matt anti-glare TN	15.6in (1920x1080) matt anti-glare IPS
Operating system	Windows 8.1 (64-bit)	Windows 8.1 (64-bit)
Processor	2.4GHz Intel Core i7-4860HQ (3.6GHz Turbo)	2.4GHz Intel Core i7-4700HQ
Graphics	2x nVidia GTX 860M SLI (8GB)	nVidia GeForce GTX 850M (2GB)
Storage	3x 128GB SSDs (RAID 0), 1TB hard disk (7200 rpm)	1TB hard disk
Memory	16GB DDR3	16GB DDR3
Ethernet	Gigabit ethernet	Gigabit ethernet
Optical drive	×	Blu-ray
Video out	2x HDMI, Mini DisplayPort, VGA	HDMI 1.4, Mini DisplayPort
Wi-Fi	802.11a/b/g/n/ac, 2x2 MIMO	802.11b/g/n/ac, 2x2 MIMO
Bluetooth	Bluetooth 4.0	Bluetooth 4.0
Speakers	Stereo	Stereo
Audio in	Built-in mic, 3.5mm line-in	Built-in mic, 3.5mm line-in
Audio out	Headphone	Headphone, line-out
USB	3x USB 3.0, 2x USB 2.0	3x USB 3.0
Card slot	SDXC	SDXC
Battery	74.7Wh lithium-polymer, non-removable	59Wh lithium-ion
Dimensions	425x303x24.5mm	383x255x27.7mm
Weight	3.24kg	2.6kg
PERFORMANCE		
Battery/iPlayer	1 hour, 48 minutes	3 hours, 19 minutes
PCMark 7	6304	3833
PCMark 8 Home	3983	N/A
PCMark 8 Work	3464	N/A

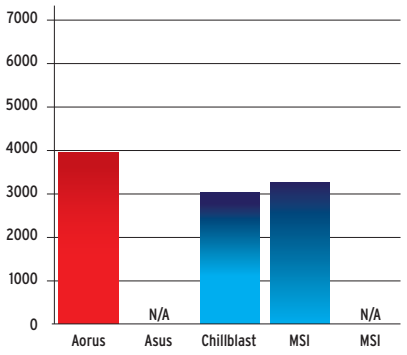
Battery life (hours)



PCMark 7 score (points)



PCMark 8 Home score (points)



CHILLBLAST **£1,250 inc VAT (£1,041 ex VAT)** ★★★★½ PC ADVISOR RECOMMENDED	**MSI** **£1,299 inc VAT (£1,082 ex VAT)** ★★★★☆	**MSI** **£1,317 inc VAT (1,097 ex VAT)** ★★★★☆
Helix	**GE70 2PE Apache Pro**	**GS60 2PE Ghost Pro**
17.3in (1920x1080, 127ppi) matt anti-glare TN	17.3in (1920x1080, 127ppi) matt anti-glare TN	15.6in (1920x1080) matt anti-glare IPS
Windows 8.1 (64-bit)	Windows 8.1 (64-bit)	Windows 8.1 (64-bit)
2.5GHz Intel Core i7-4710HQ (3.5GHz Turbo)	2.5GHz Intel Core i7-4710HQ (3.5GHz Turbo)	2.4GHz Intel Core i7-4700HQ
nVidia GeForce GTX 870M (2GB), Intel HD Graphics 4600	nVidia GeForce GTX 860M (2GB), Intel HD Graphics 4600	nVidia GeForce GTX 870M (3GB)
120GB Samsung 840 EVO mSATA SSD, 1TB hard disk	2x 128GB SSDs, 1TB hard disk (7200rpm)	2x 128GB SSDs (RAID 0), 1TB hard disk
4GB DDR3L	16GB DDR3L	8GB DDR3
Gigabit ethernet	Gigabit ethernet	Gigabit ethernet
×	×	×
HDMI 1.4, 2x DisplayPort	1x HDMI 1.4, 1x VGA	HDMI 1.4
802.11b/g/n/ac, 2x2 MIMO	802.11b/g/n/ac, 1x1 MIMO	802.11a/b/g/n/ac, 2x2 MIMO
Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0
Stereo	Stereo	Stereo
Built-in mic, 3.5mm line-in	Built-in mic, 3.5mm line-in	Built-in mic, 3.5mm line-in
Headphone, line-out	Headphone	Headphone, line-out
4x USB 3.0	2x USB 3.0, 2x USB 2.0	3x USB 3.0
SDXC	SDXC	SDXC
60Wh lithium-ion	49Wh lithium	52Wh lithium
419x287x21.8mm	418x269x39mm	390x266x19.9mm
2.66kg	3kg	1.96kg
3 hours, 45 minutes	2 hours	1 hour, 59 minutes
5710	6241	5655
3014	3251	N/A
3400	3460	N/A

MEDIA STREAMING DEVICES

These days you don't need to go to the expense of a smart TV to access services such as Netflix or BBC iPlayer. You could instead buy a media streaming device. Barry Collins puts six of the best through their paces

There has been an enormous price crash in the market for media-streaming devices in the past year or so. Devices such as the Sky Now TV Box now cost less than a new DVD – the disc, not the player. None of the six devices on test here costs more than £99, and it's now almost a no-brainer to connect one of these devices to your living-room TV instead of stumping up extra for a so-called 'smart TV'.

The advantages of having one of these devices connected to your big screen are manifold. You can stream films or television programmes from services such as Netflix or the BBC iPlayer without having to plug your laptop into the TV or have a noisy PC whirring away – all of these devices are silent in operation and consume very little power.

Smartphone and tablet owners can beam content from their phones to the television wirelessly with many of these devices, so if you want to show the family the video you shot earlier that day, or perhaps play a family game using the Scrabble app, you simply press a button on your phone and beam the picture to the big screen so that everyone can see it instantly.

Some of these media streamers can display content stored on other PCs, laptops and NAS drives connected to your home network, letting you beam your music collection into the lounge for family parties or share photo slideshows. Additional installable apps for online media services such as Spotify, Flickr and YouTube are also common.

We've got two different types of media streamer on test here. Four of the devices are 'traditional' set-top boxes that can work independently of any other device. Prices range from just £9.99 to £99, but there's a huge discrepancy in features and capabilities from top to bottom, so read the individual reviews to see which best meets your needs.

Then we have the Chromecast and its thinly veiled imitator, the EZCast, which have to be used in conjunction with a smartphone, tablet or PC to serve content to them. These dongle-like devices plug straight into the TV and can be practically hidden from sight.

Read on to find out how the features and performance of these devices compare, and the gotchas we discovered in testing.

oku TV
12:40 pm
Options
46 Items
Cable box
Blu-ray player
Game console
NETFLIX
PANDORA
huluPLUS
Channels
HBOGO
vevo
PBS

Ease of Use	★★★★½
Features	★★★½☆
Performance	★★★★½
Value	★★★½☆
Overall	★★★★☆

APPLE TV

£79 inc VAT • apple.com/uk • tinyurl.com/7j7yk4x

The Apple TV is almost the forgotten child of the Apple family, having last seen a major refresh back in March 2012. That's not to say the hardware is showing its age – it's still as sleek and powerful as anything else on the market, with full 1080p output, optical audio output and an ethernet port for those who don't want to use the 802.11n wireless.

You do have to live within the confines of Apple's walled garden, though. There's no USB port, like there is on the Roku or WD TV, for playback of your own media. Videos and music can only be shared across the home network from Windows PCs and Macs running Apple's opinion-dividing iTunes software. But once it's switched on everything works seamlessly.

Apple is picky about video formats, but you can use software such as Freemake Video Converter to convert videos into Apple TV's preferred H.264/AAC format and suitable resolution. The device supports 1080p streams of up to 30fps and we managed to stream films flawlessly across our 802.11n home network at that quality.

The interface is as polished as you would expect, and easy to navigate with the slender stick of solid MacBook-like aluminium that forms its remote control. There's a downloadable remote-control app for iPhone/iPad that extends control flexibility, especially when entering text to search for films or enter login details.

The selection of Apple TV apps is thin for British audiences, though. The only UK broadcaster to have an Apple TV app is Sky's Now TV – there's no BBC iPlayer nor other terrestrial channels. Netflix and YouTube are included, but beyond that it's largely foreign content. That said, iPad or iPhone owners can still push iPlayer and 4oD streams through their Apple TV using the wireless AirPlay technology, and once the stream has started you can carry on using the tablet/phone for other apps.

Apple TV streaming is flawless. Whether renting films from the iTunes Store or watching TV series via Netflix, we've never once see the video and audio track slip out of sync.

VERDICT: The Apple TV remains a beautifully slick streamer for those who've already invested in Apple kit, although its lack of UK content makes it far less appealing as standalone device. The prospect of an overdue hardware refresh must also be considered.

Ease of Use	★★☆☆☆
Features	★★½☆☆
Performance	★½☆☆☆
Value	★★☆☆☆
Overall	★★☆☆☆

EMGREAT EZCAST (M2)

£15 inc VAT • iezvu.com • tinyurl.com/Lakzy2z

From the near-identical hardware design to the Google-style logos splashed all over the packaging, the EZCast is plainly a Chromecast tribute act. But does this cut-price alternative (some might say rip-off) do the job just as well?

The answer is a resounding "no". First, there's the hardware design. While the HDMI dongle is all-but identical to Google's offering, the supplied USB power cable comes with a separate Wi-Fi receiver attached to it. The makers clearly didn't have the engineering expertise to squeeze it into the HDMI casing as Google did. It's not a huge problem, but it's another ugly cable dangling from your TV.

Setup wasn't the plug-and-play experience we enjoyed with the Chromecast either – it took the Android app a few attempts to detect the EZCast hardware – and the pidgin English in the supplied manual ("Avoid dropping or conflicting") meant that wasn't much help, either.

While streaming of 1080p video from our HTC One was almost flawless on the Chromecast, the EZCast suffered from horrible stuttering. The software advised us to press pause and let the footage buffer, but that provided only temporary relief. Photo streaming is fine, but the music-streaming facility is badly designed, not even giving you the option to select albums for playback.

The phone screen can be mirrored on your TV screen with the EZCast, but that involves disconnecting and reconnecting to the device, unlike the seamless switchover you get with the Chromecast.

The PC software – for which you're forced to part with your email address to download – is little better. Sometimes the software plain refused to play videos, even though they were in the exact same format as others that played fine. There's the option to mirror your entire desktop, which Chromecast doesn't provide, and even use your TV as a secondary display, which would be more useful if you could change the screen resolution settings to match that of your TV.

The also company has a privacy policy that basically allows it to share your viewing and surfing habits with third parties. We can find very little to recommend this device.

VERDICT: A poor impersonation of the Chromecast, which fails to get many of the basics right. Streaming video is choppy, screen sharing is awkward and there's no third-party app support. Simply not worth the £15 saving on Google's hardware.

Ease of Use	★★★★½
Features	★★½☆☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★★☆

PC ADVISOR RECOMMENDED

GOOGLE CHROMECAST

£30 inc VAT • google.co.uk • tinyurl.com/qbgtcs2

The Chromecast is quite unlike the Apple TV, Roku or other regular media streaming devices. It consists of nothing more than a small dongle that you plug into your television's HDMI port, and as a standalone device it does nothing at all – there are no internet channels to watch, nor even any way to control it.

It only comes alive when connected to other devices on the home network, be that an Android or iOS device, laptop or Google Chromebook. You can beam content from compatible apps on those devices, or simply mirror their screens, allowing you to turn your television into a big-screen version of your phone, for example.

Setup could barely be simpler: you plug the Chromecast into your TV's HDMI port, download Google's Chromecast app for your device, punch in an onscreen code and off you go. It's worth noting, however, that you also need to run a Micro-USB cable into the back of the Chromecast to power the device. Most modern TVs have USB ports that can be used for this job, but if yours doesn't you may need to run a lengthy USB cable from a power socket.

The selection of Chromecast-compatible apps on Android and iOS is pretty thin: Netflix, iPlayer, BT Sport and YouTube are among the highlights. There's no Sky or other UK terrestrial channels, though.

Streams are activated by pressing a button in each app and streaming quality is excellent, with little breakup and few video/audio sync issues. And once the stream has started, you can close the app on the phone/tablet and carry on using the device for other tasks.

On the PC, an extension for the Google Chrome browser allows you to stream individual browser tabs to the big screen, which worked fine. The websites of certain video-on-demand services, such as Netflix and iPlayer, are also Chromecast-compatible, allowing you to beam shows and carry on surfing elsewhere, effectively turning your television into a secondary PC screen.

Streaming of media on the home network is more problematic. There's no easy way to stream video content or music stored on your PC – a Chrome browser extension called Videostream claims to make this possible, but failed in our tests on two different PCs.

VERDICT: A great low-cost add-on for Android device users in particular, providing a simple way to beam video to the big screen. People who want to stream their own media collection should look elsewhere.

Ease of Use	★★★★☆
Features	★★★★½
Performance	★★★½☆
Value	★★★½☆
Overall	★★★★☆

PC ADVISOR BEST BUY

ROKU 3

£99 inc VAT roku.com • tinyurl.com/qhaybde

The Roku 3 distinguishes itself from the competition with a couple of innovative features found on its remote control. The remote incorporates a Nintendo Wii-like motion sensor that allows you to play games by wafting the device around. It works well enough with the bundled Angry Birds Space, although other big-name titles are conspicuously absent from the Roku's games store.

The second, more beneficial feature of the remote control is a headphone jack, allowing you to plug in a pair of headphones (a low-rent in-ear set are provided in the box) and watch movies or listen to music without disturbing others in the room or sleeping upstairs.

The sound – which is transmitted via Wi-Fi, not Bluetooth – is a little thin and prone to distortion when there's a loud explosion or blast of music, even when using an expensive pair of Sennheiser headphones, but it's fine for a late-night Netflix session.

Roku's channel selection compares favourably to the Apple TV for a British audience, including BBC iPlayer, Sky Now, 4oD, ITV and Demand 5, as well as big-name online services such as YouTube, Netflix and Spotify for free. Many channels stream in 1080p and video quality is generally excellent, although we did occasionally notice a mismatch between the picture and audio, which was irritating.

Streaming media over the home network was less successful. Our attempts to stream 1080p videos using the Plex app and media server software installed on our PC ended in outright failure, although music and photos fared fine. It was the same story using the Roku app for Android, where 1080p video became distorted in playback, although it worked fine using the iOS app.

The Roku 3 has a microSD slot that can be used to expand the internal storage, but not for media playback. You can play media locally via the USB port, however. It spat the dummy at very high bitrate 60fps 1080p video, but was fine with 24fps footage, although be warned: the Roku 3 won't automatically convert an AC3 or DTS surround-sound soundtrack to stereo, leaving you with no audio if you don't feed to a suitably equipped decoder such as in an AV receiver.

VERDICT: A premium player with a superior feature set to the other devices in this round-up. The wireless headphones are a boon and the UK content selection is superb, although we experienced lip-synch issues and network media playback is too unreliable.

Ease of Use	★★★★☆
Features	★★☆☆☆
Performance	★★★☆☆
Value	★★★★☆
Overall	★★★☆☆

SKY NOW TV BOX

£9 inc VAT • nowtc.com/box • tinyurl.com/mvgbchd

The Sky Now TV player is a rebranded Roku device, which may have you wondering whether you can get all the features of the Roku 3 for a tenth of the price? The answer, alas, is no. This is a stripped-down experience compared to the Roku 3. There's a remote control, but it doesn't have the motion controls nor the headphone socket. The video will only output at a maximum size of 720p, compared to the 1080p resolution of the Roku 3, and there's no memory-card slot or USB port for expansion or external media.

The Roku Channel Store is available, but Sky appears to have put the kybosh on some commercial rivals. The most notable absentee is Netflix, and there's no Plex channel for streaming content from other PCs (although a quick YouTube search will reveal that it's possible to add Plex by delving into the Now TV's developer mode). However, it's a not a complete lock-out for Sky's rivals: BBC iPlayer, ITV, 4oD and Demand 5 are all available.

Sky obviously subsidises this hardware in the hope of getting people to pay for its sports, movie and entertainment channels, which are of course heavily promoted on the device. The remote control has a shortcut button for the Now TV channel, and the Now TV, Sky Store and Sky News icons are irremovable fixtures at the top of the channel list. Twenty four-hour passes for all six Sky Sports channels now cost £6.99 a go. Week passes are also offered for £10.99. The entertainment and movie channels are more keenly priced at £4.99 and £8.99 per month respectively, whilst the Sky Store offers single movies on demand, costing up to £4.99 per film.

Streaming quality is not in full-HD, and we noticed the occasional lag between audio and pictures. Frame rates aren't as fast as watching satellite television, but it's sufficient for fast-flowing matches. Most worringly, though, when watching football the stream stopped entirely every five or 10 minutes, suggesting that Sky may have a major problem with its server capacity.

VERDICT: A perfectly capable media streamer, with dedicated remote control, for just £10 may look an indisputable bargain. It's light on features and obviously geared towards Sky's content, but if you want an inexpensive, fuss-free way of watching the occasional football match or TV series, it would be just the ticket providing Sky sorts out its streaming servers.

Ease of Use	★★½☆☆
Features	★★★★½
Performance	★★★★☆
Value	★★★½☆
Overall	★★★½☆

WD TV

£80 inc VAT • wdc.com/en • tinyurl.com/n6xs8ts

Our initial experience with the WD TV was distinctly choppy. It rebooted four times before we got to the setup screen, and once we'd applied a firmware update, everything was horribly sluggish. Navigating menus was appallingly slow and we could barely get any type of media – served locally or over the network – to play. Then, just before we were preparing to write it off as a faulty unit, it suddenly kicked into life, playing everything from HD video footage to music served over the network. We can only assume the WD TV was doing some pretty hefty set-up procedures that slowed it down initially, something to be aware of if you experience the same.

Western Digital claims its WD TV can "play all your media files" – and certainly we found little that troubled it. When we plugged a USB stick into the front it even coped with a very high bitrate 60fps 1080p video, something the Roku 3 couldn't manage – although it couldn't cope when we attempted the same stream over Wi-Fi. Certainly, it's the most versatile device on test here for those with large media collections stored on networked PCs or NAS drives.

Connectivity is by the far the best here, too. Two USB ports (one rear and one front-facing), HDMI, composite and optical audio outputs and an ethernet socket for those who don't have the Wi-Fi reach. We could also beam the screen of our Android phone wirelessly to the WD TV thanks to its newfound Miracast support.

Its range of online media streaming apps is less impressive for UK viewers. There's the BBC iPlayer and YouTube, but the Netflix link on our own homescreen was dead, and the rest of the channels had an international flavour. There's no Sky, Channel 4 or ITV apps on offer.

The interface is much less user-friendly than that of the Roku and Apple devices, too. It took us a while to work out how to pin apps to the homescreen (use the Option button on the remote), and navigation is generally clunky. It's not helped by a sizeable, old-fashioned remote control with buttons so pudgy that you're never quite sure whether a press has registered or not. Thankfully, there's a remote-control app for iOS and Android that's more responsive.

VERDICT: The best option on test here for people with large home media collections who want to stream content to their living room TV or hi-fi setup. It's much less attractive for those seeking a plug-and-play box to stream from online video services, however.

Conclusion

If forced to take our pick of any of the six devices on offer here, we'd narrowly plump for the Roku 3. It has the widest breadth of UK content, has a wider range of features than any of its rivals, and the headphone socket in the remote control is an inspired idea that we're surprised others haven't already borrowed.

The Apple TV would come a close second, although we're wary that a new device may be just around the corner. However, if streaming media from other PCs or NAS drives in the home was a top priority, both the Roku and the Apple TV fall by the wayside in comparison to the WD TV, which played pretty much everything we threw at it, including the ultra-high bitrate video that no other player coped with.

The Sky Now TV remains a very cheap option for those who simply want to watch the odd football match, *Game of Thrones* or BBC iPlayer.

When it comes to the plug-and-play dongles, the Chromecast really is the only choice. It's a terrific add-on for Android device owners, in particular, and affordable enough to be an impulse purchase. Beware that even Google warns that people with concurrent dual-band routers may have problems discovering the Chromecast from their other devices, but we had no such problems with our dual-band BT Home Hub 5.

	APPLE £79 inc VAT ★★★★☆	**EMGREAT** £15 inc VAT ★★☆☆☆	**GOOGLE** £30 inc VAT ★★★★☆ PC ADVISOR RECOMMENDED
Model name	Apple TV (third generation)	EZCast (M2)	Chromecast
Output resolution	1920x1080p	1920x1080p	1920x1080p
Processor	Apple A5 (single-core)	ARM Cortex A9 (single-core)	Marvell DE3005-A1
Memory	512MB	N/S	512MB
Video port(s)	HDMI	HDMI 1.4	HDMI
Audio output	Toslink optical	×	×
USB	✓ (service only)	×	×
Video formats	MPEG, MPEG-4, H.264	MPEG-2, MPEG-4, AVI, WMV, MKV, MOV, RM, RMVB	H.264, MPEG-4, VP8
Audio formats	AAC, protected AAC, MP3, ALAC, AIFF, WAV	MP3, WMA, WAV, OGG, AAC, FLAC, 3GP	AAC, CELT/Opus, MP3, OGG, WAV
Wired network	10/100 ethernet	×	×
Wireless network	802.11a/b/g/n, dual-band	802.11b/g/n	802.11b/g/n
Bluetooth	✓ (for keyboards only)	×	×
Infrared control	✓	×	×
Power supply	Built-in 6W	Micro-USB	Micro-USB
Dimensions	98x98x23mm	73x29x12mm	72x35x12mm

	ROKU £79 inc VAT ★★★★☆ PC ADVISOR BEST BUY	**SKY** £9 inc VAT ★★★☆☆	**WESTERN DIGITAL** £80 inc VAT ★★★½☆
Model name	Roku 3	Now TV Box	WD TV
Output resolution	1920x1080p	1280x720p	1920x1080p
Processor	N/S	N/S	N/S
Memory	N/S	N/S	N/S
Video port(s)	HDMI	HDMI, composite	HDMI 1.3, component, composite
Audio output	×	×	Toslink optical, RCA
USB	1x USB 2.0	×	2x USB 2.0
Video formats	MPEG-4, H.264, MKV (H.264)	N/A	AVI, VOB MKV, TS/TP/M2T, MP4/MOV, M2TS, WMV9, FLV
Audio formats	AAC, MP3	N/A	MP3, WAV/PCM/LPCM, WMA, AAC, FLAC MKA, AIFF, OGG, Dolby Digital, DTS
Wired network	10/100 ethernet	×	10/100 ethernet
Wireless network	802.11a/b/g/n, dual-band	802.11b/g/n	802.11b/g/n
Bluetooth	×	×	×
Infrared control	✓	✓	✓
Power supply	Mains adaptor	Mains adaptor	Mains adaptor
Dimensions	89x89x25mm	84x84x23mm	99x124x30mm

Electric car tech: is it time to get behind the wheel?

Should your next car be an electric vehicle? Ben Griffin weighs up the pros and cons

Petrol and diesel might not run out in our lifetimes, but the alternatives are beginning to make inroads, largely thanks to rising fossil fuel costs and concerns about the planet's wellbeing. At some point, whether we want to or not, we will have to change our wasteful ways.

Hybrid cars such as the Prius have been around for longer than most people realise, but fully electric vehicles (EVs) are still pretty new. New, that is, in the sense they are being re-explored after their heyday in the 1900s – before the combustion engine rose to prominence.

It seems strange that such an old and reliable technology is having to play catch-up. But with advances in lightweight materials, car construction and battery technologies, the electric car is now more viable than ever.

The government offers some hefty incentives to switch to all-electric, but is it enough? We'll look at the technology inside EVs, including convenience features such as apps for controlling and monitoring charging, as well as the proliferation (or lack) of charging points and options.

State of the market

The negatives

Electric cars are wonderful in theory, especially if the electricity used to power them comes from a renewable and clean source such as wind or tidal power. But they are hamstrung by a few key issues, the first of which is range. The majority of electric cars have at best a 150-mile range before running out of juice. That may sound plenty, but most manufacturers are presenting their best-case figures. A number of variables such as temperature and driving style will bring that total figure down. Even if a perfect range is practically achievable, 150 miles means you can go only 75 miles before the return journey becomes impossible without you having to stop to charge. That's a far cry from the hundreds of miles a diesel can manage.

At this point, the next big issue comes into play. While Britain's electric car charging network is certainly getting better, some journeys really do require forward planning if you don't want to find yourself left stranded by the roadside.

It doesn't help that your average electric car takes such a long time to charge by a conventional socket – think days, not hours. See how your boss reacts when you explain you couldn't make it in because your

Free fuel here: the battery charging network set up by **ECOTRICITY** on the UK's motorways costs nothing to use

car was only half-charged. Luckily, most manufacturers offer a fast-charging system for your home for a fee, which speeds up the process to overnight.

You can also apply for a domestic charging grant, which, if you're eligible, would give you a permanent solution to recharging your car quickly at home.

The final major hurdle is price. Electric cars are expensive, even though the government offers a £5,000 plug-in grant. A Nissan Leaf and full ownership of the battery will set you back £21,490 after the grant has been factored in. A VW e-Up, meanwhile, is £19,270 – that's more than double the price of the £8,635 1-litre petrol model.

But that assumes you buy the battery outright, which adds to the drive-away cost. Some manufacturers may only allow you to lease the battery, others will give you a choice. The battery lease option for a Nissan Leaf starts at £70 a month, but soon ramps up if you plan to do more miles a year.

Yet battery leasing does have benefits. If at any point the battery goes wrong or stops charging for whatever reason, the car manufacturer will swap it for no extra cost. Buying the battery outright would land you with a hefty bill to replace the batteries. And replacement costs thousands – around £8,000 in the case of the Nissan Leaf.

The positives

Electric vehicles may be inherently expensive but they can still work from a financial perspective. The most obvious advantage here is the fuel cost. Rather than demanding petrol at £1.50 a litre for however many miles the car can manage, an electric car needs only electricity. Depending on your electric tariff and charger type, you can pay as little as £2 for a full charge. That is pretty cheap motoring for 150 miles.

Then there's the CO2 emissions, or, rather, the complete lack of them. Zero emissions means exemption from vehicle excise duty and from the London congestion charge, saving you £10 a day in the case of the latter. All you have to worry about in the case of London is the annual £10 registration charge.

Maintenance is another plus point. Electric motors run without oil and are simple to repair. The electric motor is, after all, a relatively well-established technology. Nor is there any need to replace the exhaust, say – there isn't one on an electric car.

The garage cost will vary from manufacturer to manufacturer, but it is usually at least comparable with a fossil fuel equivalent. Servicing is needed as frequently as with a petrol or diesel engine, but the far fewer moving parts in an electric car mean, in theory, that less time is needed to check everything over.

Sadly, the expertise required means you will have to go to a main dealership to get any work carried out, as electric car repairs are going to be out of the reach of most garages. Dealers (sometimes referred to as 'stealers' because of the prices they charge) will likely charge a premium. A Tesla Model S service, for instance, costs £500.

On this subject, breakdowns will probably be an issue for most electric cars. The need for specialist tools and know-how makes roadside recovery and repairs a problem. Still, roadside recovery providers are upping their game, with the AA offering access to a fast portable charger if you run out of juice.

While many of us love the roar of an engine, an electric vehicle is eerily peaceful, with only the hum of the car cutting through the air, the friction of the rubber on the tarmac and the talkativeness of your passengers encroaching on the silence.

Even with all the savings, the initial financial outlay will take some time to recoup. Years, in fact, unless you drive serious miles. But there will be a point where you start to see a return, providing you keep the vehicle long enough. You should also factor in a decreased reliance on fossil fuels that will eventually run out.

Cars and prices

Nissan Leaf

There are a number of electric cars on the market. Perhaps the best known is the Nissan Leaf, which in its latest form offers a range of 124 miles. It starts from £21,490 if you buy outright or £16,490 plus at least £70 a month for the battery lease, depending on your mileage requirements. The government plug-in grant is included.

VW e-Up

The all-electric version of the VW e-Up supermini is one of the better options on the market. It costs from £19,270 before any extras and has a range of 93 miles, which is enough for cruising about town.

One of the cheapest all-electric cars around, the **RENAULT ZOE** still imposes a stiff entry cost of £13,995

The designers went back to the drawing board for the **BMW I3**, whose 'range extender' is a 647cc petrol engine

Ford Focus Electric
Exactly like the Ford Focus, only with an electric motor instead of petrol or diesel. While it is a very smooth and practical car, the asking price of £28,580 is steep given it has a range of only 100 miles.

Tesla Model S
A beacon for what electric cars can do, the Tesla Model S is fast and frugal – although mighty expensive as well. In its 60kWh battery form, it can do 240 miles. Go for the pricier 85kWh model and you can expect 300 miles. It has a gigantic touchscreen display and, in its Performance guise, absurd performance. 0 to 62mph takes 4.2 seconds, for example. Prices start from £49,900.

Renault Twizy
This bizarre two-seater looks more like a bike than a car, especially as the windows are an optional extra. Still, the Twizy is an incredibly cheap electric car for those who need a runaround, with prices starting from £6,895. A range of between 30 and 50 miles is hardly plentiful, but okay for urban life.

Mercedes-Benz B-Class Electric Drive
Mercedes is no stranger to electric cars, as the bright green SLS AMG Electric Drive supercar proves. On a more realistic scale, the company has also released an all-electric version of the B-Class, which is a premium attempt at electric motoring. Prices reportedly will start from £32,000.

BMW i3
Some manufacturers are turning their existing cars electric but BMW has gone in at the deep end, building two cars from the ground up that look, quite honestly, like they are from a different planet. We'll ignore the impressive i8 because it costs £100,000. The i3 is a more realistic proposition, although the £30,680 entry price is hardly cheap. Without the range extender it can do up to 100 miles on a single charge.

Renault Zoe
Another solid option for wannabe electric car owners is the Renault Zoe. It's stylish and practical, and costs from £13,995. Not bad considering it has a range of up to 130 miles, although you will need to pay a minimum of £70 a month to lease the battery.

The electric **FORD FOCUS** has the same design as its petrol cousins and has a range of 100 miles

Smart ForTwo Electric Drive
A smart choice for frugal motorists. The Smart ForTwo Electric Drive (pictured on page 98) costs from £15,395 in coupé form and £16,895 for the cabrio. Again, there is an option to buy outright or rent the battery.

Second-hand
The expectation of having to replace the batteries one day, even if they are expected to last up to a decade, may well weigh heavy on the price of second-hand EVs. There are some good deals around if you are tempted. A used 2013 Nissan Leaf, for instance, could be yours for £13,995.

If you go this route, check the warranty and make sure it carries over. Ask to see the maximum charge capacity if you can to get an idea of the battery condition. With so few electric cars on the road, it is hard to judge the second-hand market at this time.

Charging options
Your first option for charging your electric car is to do it at home. However, this can be a slow process if the battery is on the large side. It is, therefore, usually a good idea to get a fast charger from the manufacturer if it offers that option.

When out and about, Zap-Map provides a map of charging points you can make use of. It displays each charger using a colour so you know whether to expect a slow, fast or rapid AC charge or rapid DC charge. You can search by vehicle if you're unsure what your vehicle needs. A rapid charger can charge an electric car to 80 percent of its capacity in less than half an hour so you need not wait too long to get motoring again.

Tesla owners can make use of the company's growing supercharger network for free. Superchargers are being installed across busy routes, including the journey to Europe.

Another supplier, Ecotricity, offers its motorway-located Electric Highway to everyone for free. All you have to do is swipe a card, which you can register for free, and you have access to the various charging point types. Just bear in mind that you will have to pay for parking if the service station is anything but a Welcome Break.

Another charging option is Source London. For £10 a year electric car owners can refuel at more than hundreds of charging

The **RENAULT TWIZY** may look like a ride-on lawnmower with a fairing, but your wallet will feel the difference

points throughout the capital. All it requires is an annual membership that costs £10.

Sadly, as you are unable to book a public charging point, you may have to wait while a fellow eco-friend finishes charging their vehicle. With electric car numbers still low, this should be a non-issue but popularity will change that.

A little prior research into the charging plug for your car will ensure you can fill up on the move if you are ever caught short. Just remember to keep an eye on the car – it is not unheard of for someone to pull out the plug for fun.

In terms of the energy cost, Ecotricity offers car owners 1,000 miles of free electricity, making a nightly charge even cheaper. The actual cost of charging a vehicle will depend on your usage and battery capacity and your energy rate. This could range from £1 to £4 – still, far cheaper than filling up. Check with your energy supplier to see if an electric car tariff is on offer.

Certain places in the UK offer free parking for electric vehicles, Westminster and Islington being two examples.

Tech

A battery will last for up to 10 years. Tesla guarantees its battery for eight years on the 85kWH model. It is too early to say how reliable the batteries will be, but most manufacturers will cover a drop in battery capacity under the warranty – 70 to 75 percent, usually.

Early indications from electric car owners suggest the range of a battery changes little if at all, but it may be that over the next few years the real truth emerges. Of course, batteries may outlive their shelf life and everyone will be happy.

A number of apps allow owners to do some pretty cool stuff with their car. Planning an early morning? You can pre-warm or pre-cool a car's cabin. Lost your car? Some apps will show you on a map where you need to go to be reunited.

The free Tesla app can tell you your remaining range and where to charge up without you being in the car, which can help you plan your day. It can even flash the lights, honk the horn and, in case the car has been stolen, track its whereabouts.

Some manufacturers offer the ability to send route destinations to your car from a computer using Google Send to Car. So there's no need to write a postcode down on a bit of paper any more.

Conclusion

The Tesla Model S is obviously only for the wealthy, but change has to start somewhere. In many ways the Californian company has shown the world you can have a comfortable, practical and extremely fast all-electric vehicle. That can only be a good thing in the context of Toyota's recall of 1.9 million Prius cars to fix software problems earlier this year.

Even with more realistic vehicles like the Renault Zoe, price is still a big barrier to entry. For the price of an electric car you could buy a new petrol or diesel vehicle, with a frugal small engine and big turbo combination, and see 60 miles per gallon or more – use the upfront saving to buy fuel and you are laughing.

Whether you should buy an electric car depends on your current situation. Those who wait for the next generation of EVs will probably benefit from bigger ranges, cheaper batteries and increasingly efficient production processes that will cut costs.

But if you can afford the initial outlay, are happy being a bit of a guinea pig and want to do your bit, go ahead. A bit of planning is often all that stands between you and much cheaper motoring in the long run if your journeys are usually short but frequent.

Motorway reps and other big mileage drivers, however, will have to go the hybrid route or stick with a solid diesel or petrol, mainly because the range of an electric car will be so very limiting. It really isn't feasible to sit on the motorway for an hour while your car recharges.

Hopefully all-electric cars will bring affordable, greener motoring to the millions who are currently strapped by ridiculous fuel prices, rising insurance and other costs. But there is still a way to go. The government could step up and offer a larger plug-in grant to speed the process.

Perhaps most importantly of all, don't resent or dislike those who do take the plunge now. The more electric cars are sold, the most car manufacturers will really put the effort in, leading to greater affordability and improved technologies. ☒

The **TESLA MODEL S** offers absurdly brilliant performance – 0-60 in under 4.2 seconds – and a 240-mile range

GOOGLE'S BIG 3

PRODUCTIVITY SERVICES EXPLAINED

By Christopher Null

Google's recent upgrades to Google Drive have made clear that the company is going head to head with Microsoft on productivity services. Unfortunately, in its efforts to emulate the industry standard, Google has made its cloud-based apps every bit as Byzantine as Office 365.

Google's services overlap and their names aren't self-explanatory. This problem is aggravated by the company's propensity to frequently change those names, consolidate services under one moniker, or simply discontinue them altogether.

Naming confusion aside, Google is offering three major productivity services: Google Drive, Google Apps for Work, and Google Drive for Work.

Here's an analysis of each to help you decide whether which service is right for you.

We have left for another occasion Google's non-productivity-related business services such as Google AdWords, Google Analytics and Google Payments.

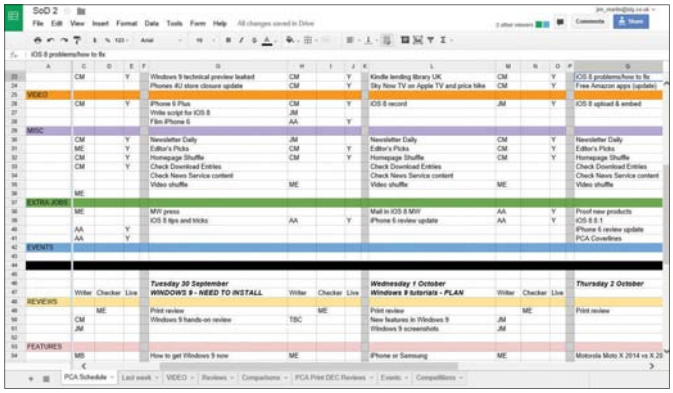
Illustration by Shaw Nielsen

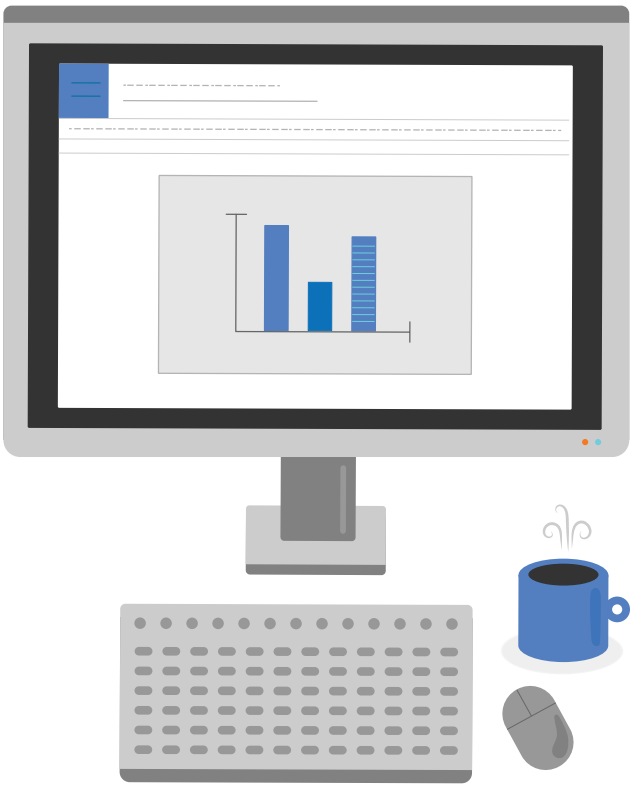
Google Drive

Google Drive is an individual-level tool and probably the best-known of all Google's services. At its heart it's an online storage system for everyone

You can store pretty well anything on Google Drive – plug-ins let you work directly on it through Windows and other operating systems – but the real productivity benefit comes when you use Google's business apps, which are integrated directly into Google Drive. These apps include standard business tools: a word processor (Google Docs), a spreadsheet (Google Sheets) and a presentation tool (Google Slides). You can create documents with these tools from within Google Drive. You can also upload documents, convert them to the relevant Google format and then continue to edit them online.

Google Drive competes with Microsoft OneDrive, which also lets you store all manner of files, as well as create and edit files, for free. OneDrive gives you 15GB of space for signing up.

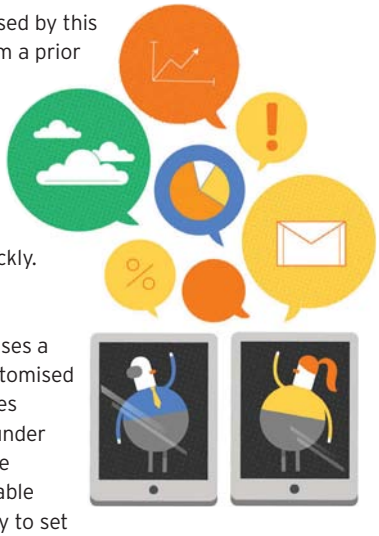




Google Apps for Work

Google Apps for Work – or, in the US, Google Apps for Business – offers invaluable email management facilities plus all the online software and storage of Google Drive

Part of the confusion aroused by this service's name stems from a prior product called Google Apps Standard, which is a free and stripped-down version of Google Apps for Work. Google discontinued Apps Standard in 2012 because, it said, users outgrew it too quickly.

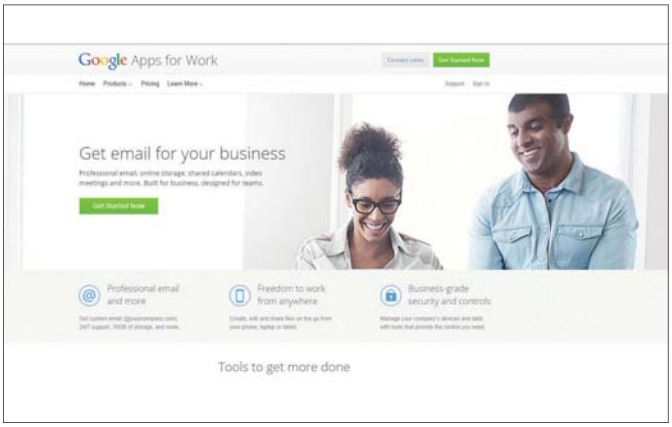


Emphasis on groups

Google Apps for Work comprises a sprawling set of services (customised for use in groups) that includes everything described above under Google Drive, along with some additional features. Most notable among the extras is the ability to set up your own email system (with your own domain), shared calendars, and video meetings and presentations via Google Hangouts. Many companies that have adopted Google Apps for Work use it heavily for its email features; the ability to collaborate on document creation and editing is almost an afterthought.

Subscribers can manage their Google Apps for Work setup through a central tool, called Google Admin, where you can add and delete approved users and devices and perform various other basic file maintenance chores.

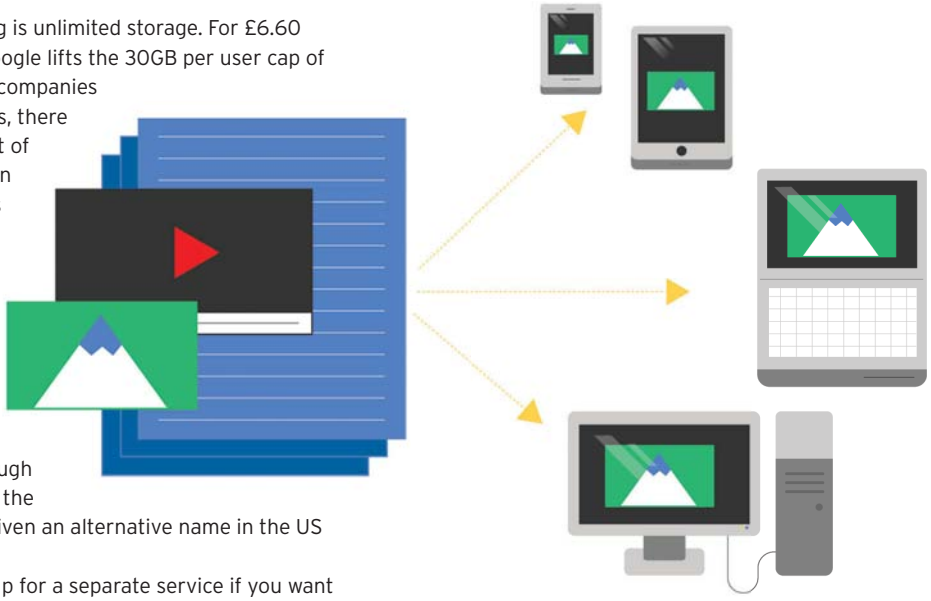
Google Apps for Work is pretty inexpensive: £3.30 per user per month. Google Apps for Work users get 30GB of total storage space each, which is double the free Google Drive limit. However, if that's not enough, there's Google Drive for Work (see opposite).



Google Drive for Work

The latest addition to the Google Drive/Apps family is Google Drive for Work, which mostly amounts to an expansion of storage space for customers of Google Apps for Work

The heart of this offering is unlimited storage. For £6.60 per user per month, Google lifts the 30GB per user cap of Google Apps for Work. For companies with five or more paid users, there are no limits on the amount of storage space each user can occupy; there's a capacious 1TB per user if you have fewer than five users.



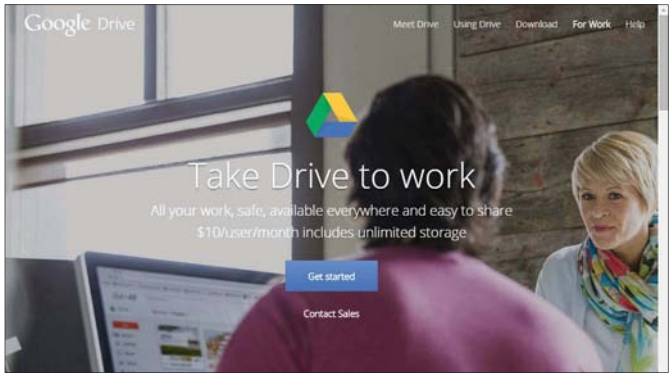
Enhanced security

Google Drive for Work is folded directly into the Google Apps for Work service in the UK as a premium option, although just a week after its launch the service had already been given an alternative name in the US – Google Apps Unlimited.

You don't need to sign up for a separate service if you want to use Google Drive for Work; it's available as an option on the Google Apps for Work pricing page when you sign up.

In addition to unlimited storage (or the vastly improved limit in the case of smaller businesses), Google Drive for Work offers improved security and manageability. For example, you get the power to decide whether users can install the Google Drive Windows client on an individual basis.

Google Drive for Work also includes a component called Google Vault – although it is also known as Google Apps Vault – which allows you to archive the entire content of your company's email and web chat for the amount of time that you set. This feature alone could be essential for certain businesses where strict data retention rules must be followed if they are to comply with the law.



Going forward

Once you get a handle on Google's erratic naming scheme, understanding the differences between its offerings ultimately isn't too difficult. One thing's for sure, though: it will all probably change again, and sooner than you might think

SERVICE	TARGET MARKET	COST	STORAGE SPACE INCLUDED	UPGRADES	KEY FEATURES
Google Drive	Individuals	Free	15GB	100GB (£1.19 per month) to 10TB (£60.16 per month)	Cloud storage, productivity apps
Google Apps for Work	Business users	£3.30 per user per month or £33 per user per year	30GB per user	Google Drive for Work	Cloud storage, productivity apps, custom domain email, calendar, video chats
Google Drive for Work	Business users	£6.60 per user per month or £79 per user per year	Unlimited (1TB per user if fewer than five users	None	Everything in Google Apps for Work along with expanded storage, additional security and data archiving facilities

WHAT'S NEXT FOR WI-FI?

While you're considering which 802.11ac router to buy, the industry is working to render that standard obsolete. Eric Geier reports

Illustration by John Hersey

Now that blazing-fast routers based on the IEEE 802.11ac standard are finally entering the mainstream, intrepid engineers are cooking up all-new hardware that will make that gear's performance seem poky by comparison.

That's not to say 802.11ac is about to fall by the wayside – the IEEE (Institute of Electrical and Electronics Engineers) didn't officially ratify the standard until December 2013. It's just that the chipsets capable of delivering all the features and performance of 802.11ac are still in development.

The truth is, most of the first 802.11ac routers on the market were based on draft versions of the standard. Although some newer Wave 1 models, such as Netgear's six-antenna Nighthawk X6, are implementing a few tricks to squeeze more performance from that technology, a second wave of 802.11ac routers are set to hit store shelves early in 2015. Those devices will support optional features that will deliver even higher wireless performance. Around the same time, new and complementary wireless standards made for specialised applications will also appear.

In the end, there's no point in trying to cheat obsolescence by putting off your next router purchase, because the industry is already hard at work developing the successor to 802.11ac.

The two-party system

The IEEE defines Wi-Fi standards such as 802.11ac and the older 802.11n. The Wi-Fi Alliance (an association of companies that build wireless-networking devices) certifies that the hardware based on those standards will work together.

Wi-Fi Alliance certification isn't a requirement – hardware manufacturers pay for the designation – but it can be reassuring to consumers, especially in the early days of a new standard. The promise that hardware will work as expected is important because the IEEE can take years to finalise standards; for example, it started working on 802.11ac in 2008 and finished in late 2013. Equipment makers often don't want to wait, so as soon as the ink dries on an early draft, they market new products based on that draft standard. Buffalo shipped out the first 802.11ac router in 2012, but the Wi-Fi Alliance didn't launch its first 802.11ac certification program until the middle of 2013.

What's so special about 802.11ac?

For starters, it operates on the 5GHz frequency band, which is less crowded than the 2.4GHz band; as a result, its signal is less susceptible to interference.

In addition, its performance significantly exceeds that of the previous standard. SU-MIMO (single-user multiple-input/multiple-output) technology, one of the hallmarks of the older 802.11n standard, allows the transmission of multiple spatial streams to a single client. This technology carries over to 802.11ac, which adds a more-powerful modulation technique (among other things) to produce an impressive maximum physical link rate of 433Mb/s per spatial stream.

Because a Wave 1 802.11ac router can support up to three streams simultaneously, it can send and receive data at a top physical link rate of 1.3Gb/s. Compare that with an 802.11n router, which provides up to three spatial streams with a maximum physical link rate of 150Mb/s each (for aggregate throughput of 450Mb/s).

In April, Quantenna Communications announced its first Wave 2 802.11ac chipset (tinyurl.com/qx66nwv). As previously stated, the second wave of 802.11ac routers is slated to arrive sometime next year. These router models will take advantage of optional elements of the 802.11ac standard. First, they'll support MU-MIMO technology, which will allow them to transmit multiple spatial streams to multiple clients simultaneously.

Secondly, they'll bond multiple channels on the 5GHz frequency band to create a single channel that has 160MHz of bandwidth. (Wave 1 802.11ac routers can bond 5GHz channels, but the resulting channel is only 80MHz wide.) Finally, whereas 802.11n and Wave 1 802.11ac routers support a maximum of three spatial streams, Wave 2 802.11ac routers can support as many as eight spatial streams.

Using wider channels or additional spatial streams (not enough bandwidth is available to do both), improved beamforming (tinyurl.com/nf2vvdh), and other techniques, Wave

> **"The second wave of 802.11ac routers will deliver even higher wireless performance"**

New technology brings faster connections

Single-user MIMO
Serves one device at a time

Multi-user MIMO
Multi-user beamforming serves multiple devices simultaneously

2 802.11ac routers will deliver maximum physical link rates in the range of 7- to 10Gb/s.

The next new Wi-Fi: IEEE 802.11ax

In a recent briefing, Greg Ennis, the Wi-Fi Alliance's vice president of technology, says the IEEE anticipates that the successor to 802.11ac will be 802.11ax. Although the standards body doesn't expect to ratify 802.11ax before March 2019, products based on a draft could reach the market as early as 2016 – just as we saw draft-802.11n and draft-802.11ac products before those standards received official ratification.

One of the top objectives of 802.11ax, according to Ennis, is to quadruple speed to individual network clients – not just to increase the speed of the network overall. Chinese manufacturer Huawei, which has engineers in the IEEE 802.11ax working group, has already reported Wi-Fi connection speeds up to 10.53Gb/s on the 5GHz band.

Ennis explains that the 802.11ax standard will improve Wi-Fi speed and reliability in environments with high numbers of users, such as hotspots in public venues, by employing the available spectrum more efficiently, doing a better job of managing interference, and enhancing underlying protocols such as MAC (medium access control) data communication.

The 802.11ax standard will also use OFDMA (orthogonal frequency-division multiple access) to boost the amount of data a router can transmit. Like OFDM (orthogonal frequency-division

> **"Products based on a draft of the 802.11ax standard could reach the market as early as 2016"**

DELL'S WIRELESS DOCK D5000 operates a short-range network on the 60GHz frequency band to eliminate the need for display, mouse, keyboard, and audio cables

> **"Operating in the 900MHz band, a network based on 802.11ah would easily penetrate walls"**

multiplexing) OFDMA encodes data on multiple subcarrier frequencies, in essence packing more data into the same amount of air space. The 'multiple access' portion of the OFDMA name describes a means of assigning subsets of those subcarrier frequencies to individual users.

Complementary standards

While one segment of the IEEE is working to define the successor to 802.11ac, other factions are developing two complementary wireless-networking standards that address particular needs.

First, the IEEE 802.11ad (tinyurl.com/aL5d9nm) standard employs unlicensed spectrum in the 60GHz frequency band to build fast short-range wireless networks with peak transmission rates of around 7Gb/s.

Transmitting data at 60GHz has two major drawbacks – the extremely short waves have difficulty penetrating walls, and oxygen molecules begin to absorb electromagnetic energy at 60GHz. That explains why the relatively few 60GHz products to reach the market so far are designed to operate at very short range, or just within a single room. The Dell Wireless Dock D5000 (tinyurl.com/q58on6u) is a good example of the former, and the DVDO Air (dvdo.com/air3), which streams HD video and audio from a Blu-ray player to a video projector without a cable, is a great example of the latter.

In late 2013, the Wi-Fi Alliance announced that its 802.11ad certification brand: The group will stamp interoperable 802.11ad products as 'WiGig Certified' (tinyurl.com/Lpe92vk) when the certification program begins in 2015.

The IEEE 802.11ah standard, meanwhile, resides at the opposite end of the spectrum. Operating in the unlicensed 900MHz frequency band, a wireless network based on 802.11ah would penetrate walls, but it wouldn't deliver much bandwidth – only 100Kb/s to 40Mb/s. Such technology might be useful for sensors and probes in connected homes or commercial buildings; 802.11ah could be considered a competitor to the Z-Wave and ZigBee protocols in the 'Internet of Things' arena, too. The IEEE isn't expected to ratify this standard until January 2016.

Wi-Fi for every need

Look past all the alphabet soup, and you'll see that the future of Wi-Fi centres on the evolution of standards that can meet the demands of new generations of wirelessly connected devices. When those new generations include everything from enterprise printers to egg timers, you can bet we'll need all of the flavours of Wi-Fi that are coming down the pike.

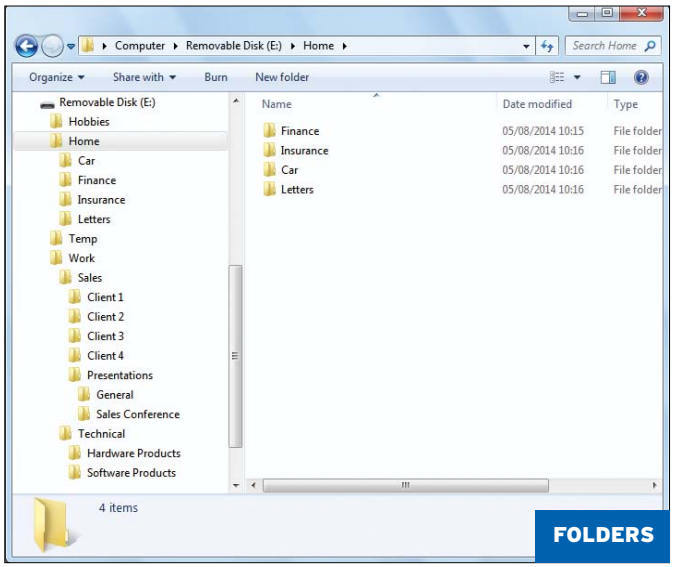
21 TOP TIPS FOR MAKING WINDOWS BETTER

Mike Bedford explains how to use and configure Windows to get the most enjoyment and productivity

Windows might not be as exciting as all the applications you use on a day-to-day basis but knowing your way around the operating system and understanding how to configure it to suit your way of working is the key to getting the most from your PC. With this in mind, we offer our 21 top tips for making Windows better.

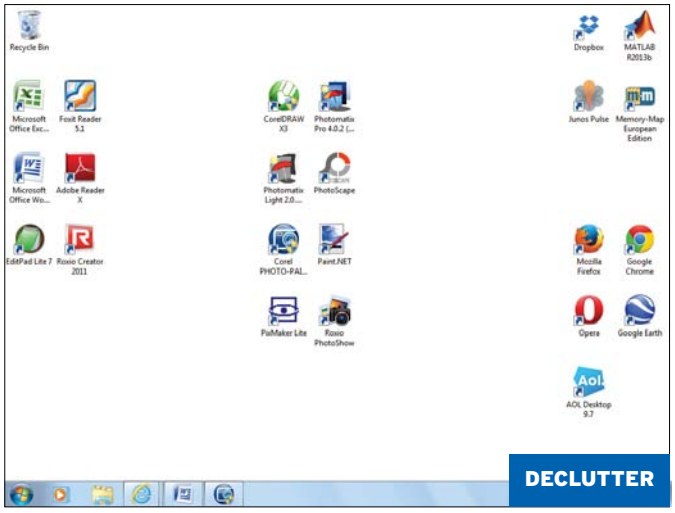
Mostly, our advice will help you do things more quickly and enjoyably, although one or two of our tips concern setting up Windows to suit your preferences and tastes. Given that a personalised interface can make you feel more at home on your PC, this too will make you more productive. Some of our tips are equally applicable to a new PC or one you've been using for some time. However, because a PC can get increasingly difficult to use as it fills up with applications and documents, we also provide some advice to help you declutter your PC – or at least find your way around it more easily.

Most of our tips apply equally to Windows 7 and Windows 8, although some advice focuses specifically on Windows 8. Whatever version of Windows you use, though, and whether your PC is old or new, we trust that you'll find plenty here to help you use your computer more effectively.



Arrange your folders

Documents are hard to find if you put them all in the same place on your disk, such as the My Documents folder. So make sure that you organise your documents into folders – perhaps one for work, one for household stuff, one for your hobbies, and so on. Don't forget that you can also put folders inside other folders so you might create subfolders in your work folder for each project you're working on.

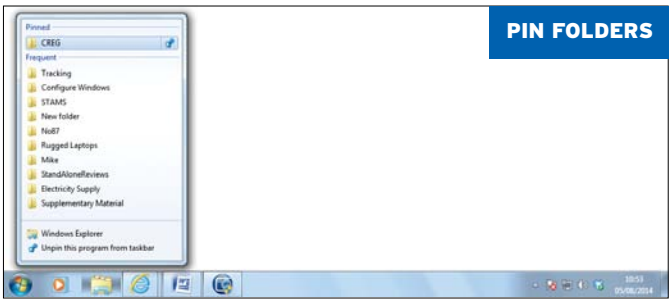


Declutter your desktop

The reason for putting icons are on your desktop is to make it easier to find the applications and documents that you use most often. However, if all your applications have desktop icons, then that advantage is lost. That makes it a good idea to remove all the clutter on the desktop. You could also try moving icons around so that related software (for example, Word, Excel and PowerPoint) is grouped together – remember to disable 'Auto arrange icons' first by right-clicking the desktop, selecting View and then unchecking the option.

Pin folders to Windows Explorer

Make folders easier to access by pinning them to Windows Explorer. You just drag the folder from Windows Explorer into the taskbar to pin it. Now, if you right-click on the Windows Explorer icon in the taskbar, any pinned folders will appear at the top of the list. Only pin folders you're using a lot (to unpin them, click on the pushpin in the list), otherwise they'll get lost among all the other pinned folders.

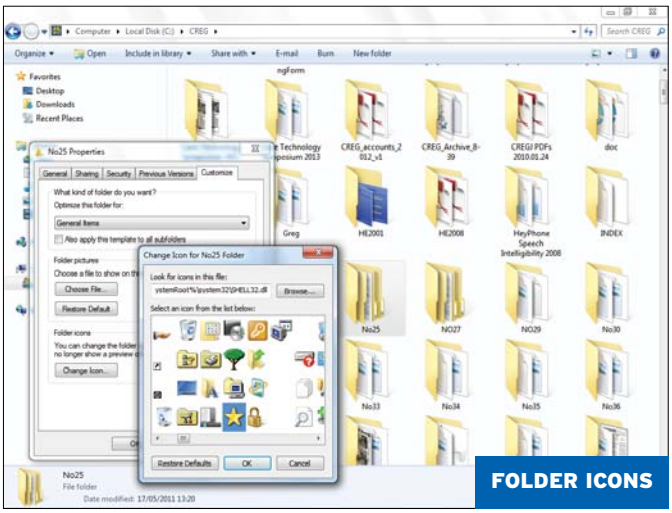


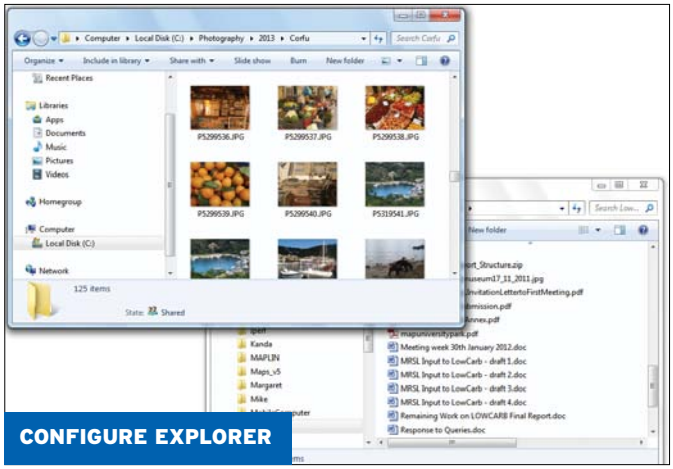
Use multiple desktops

We've already recommended decluttering your desktop but there is another effective way to simplify your screen and that is to set up multiple virtual desktops and divide all the different icons you need between them. You could have one desktop for games, for example, one for office productivity applications, and another for photographic and graphic work.

Highlight important folders

Want to be able to notice important folders at a glance in Windows Explorer or your applications? The secret is to highlight those folders using a different icon than the usual picture of a beige folder. To do this, right-click on the folder in Windows Explorer, select Properties and then the Customize tab. Click on 'Change Icon' and make your choice. You can even use your own icon by clicking Browse and choosing an image.



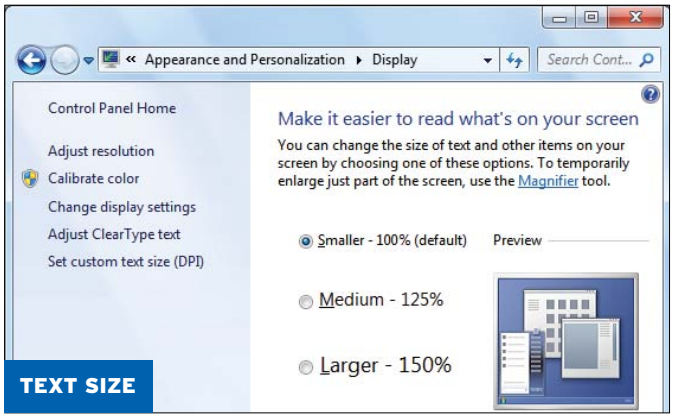


Configure Windows Explorer

Windows Explorer lets you display the contents of folders in various ways and remembers what you've chosen, so it makes sense to choose appropriate views for each folder. For one containing photos, for example, use medium or large icons so you can see a thumbnail of each; for one with Word documents, selecting List lets you view more files on screen at once.

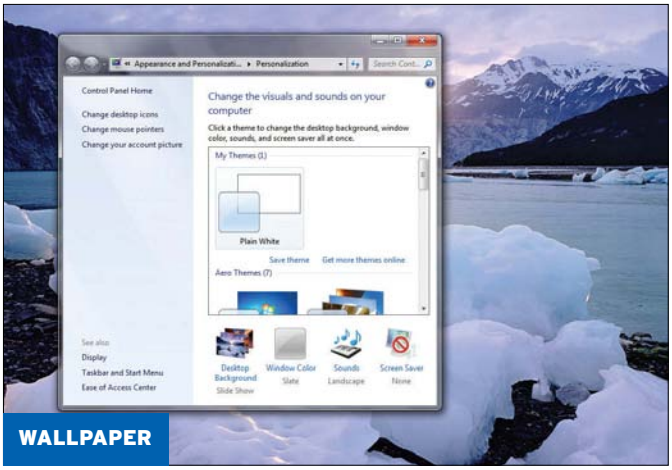
Optimise text and icon size

While you can zoom inside most applications if the text is too small, you might find the text and icons in Windows too small to read easily if you have a high-resolution display (3840x2160, say). If so, up the size to 125 percent or 150 percent at Control Panel > Appearance and Personalization > Display > Make text and other items larger or smaller.



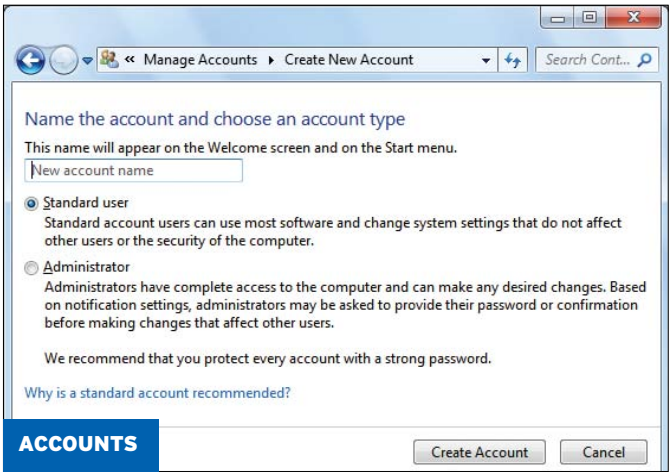
Use desktop gadgets

Although not included with Windows 8 as standard, Windows 7 has several useful desktop gadgets – a calendar, for example. Right-click on the desktop, select Gadgets from the menu and drag any gadgets you want from the Gadgets window onto your desktop.



Change the wallpaper

You might have used your own photographs as desktop wallpaper but icons stand out much more easily when the background is plain – ideally white. If you can't bring yourself to use white wallpaper, look out for attractive photos that don't have too much detail. You could even try desaturating or lightening a photo in your photo editor so the desktop icons will appear more distinct against it.

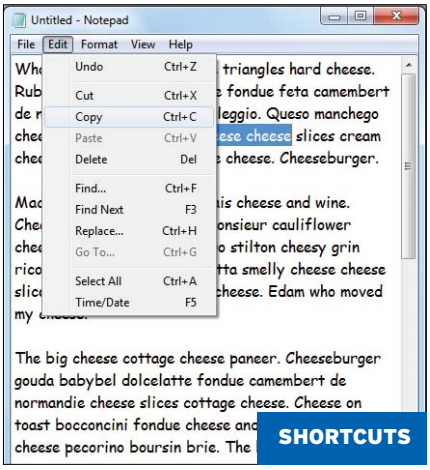


Add user accounts

If more than one person uses your PC, set up user accounts so that each can configure Windows the way they like it without affecting everyone else. It also lets each user easily keep their documents together but separate from everyone else's. Go to Control Panel > User Accounts and Family Safety > Add or remove user accounts.

Learn a few shortcuts

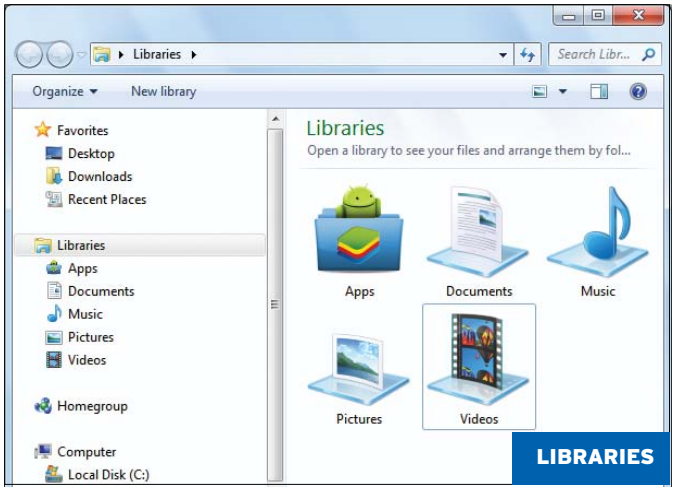
Although you can do pretty much everything using menus, Windows also defines lots of key sequences that are used by applications as well. This might seem an old-fashioned way of working but using shortcuts is often a lot quicker than selecting entries from menus. You're not going to learn them all at once



but three commonly used actions that you can easily remember to speed things up are Ctrl-X for cut, Ctrl-C for copy, and Ctrl-V for paste. Menus often display any keyboard shortcuts available for options.

Make use of libraries

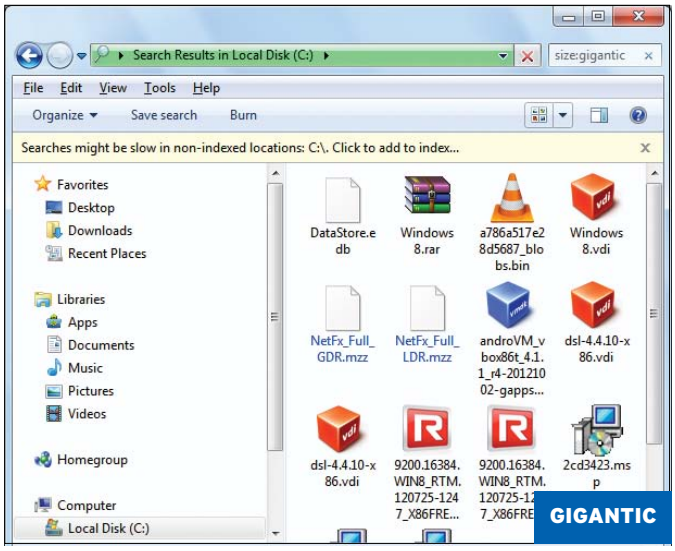
Libraries make it a lot easier to manage some types of files – most commonly used documents, music, photos and videos, for instance. They might look like ordinary folders but they're far more. Rather than putting files and folders into libraries – although you can do that too – you just tell Windows which folders to include in each library. The files aren't actually copied to the library; they remain in their original locations but appear to be in the library too.



LIBRARIES

Search out huge files

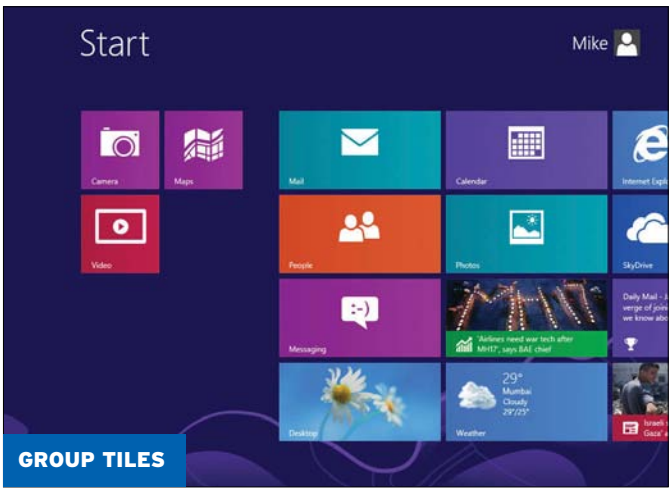
Big files clog up your hard drive and many are just garbage that you can delete. Instead of downloading a utility to find and remove them, use Windows Explorer. Simply type **size:gigantic** into the Search box and Windows will show you all files larger than 128MB in the folder (and subfolders) you're currently browsing. Delete any that you're sure you don't need.



GIGANTIC

Group Windows 8 tiles

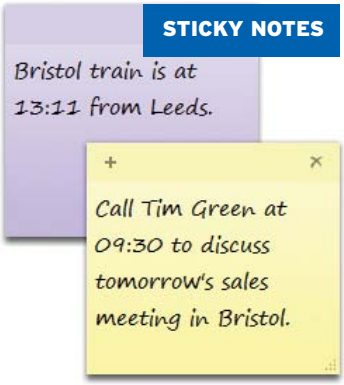
If your Windows 8 Start screen is cluttered with tiles, try grouping them so that the related ones are kept together. Drag your first tile to an open space at the left or right of the Start screen. When a grey bar appears behind it, to indicate that it's part of a new group, release the tile. Now drag the other tiles that you want to appear in the group into the same area.



GROUP TILES

Use sticky notes

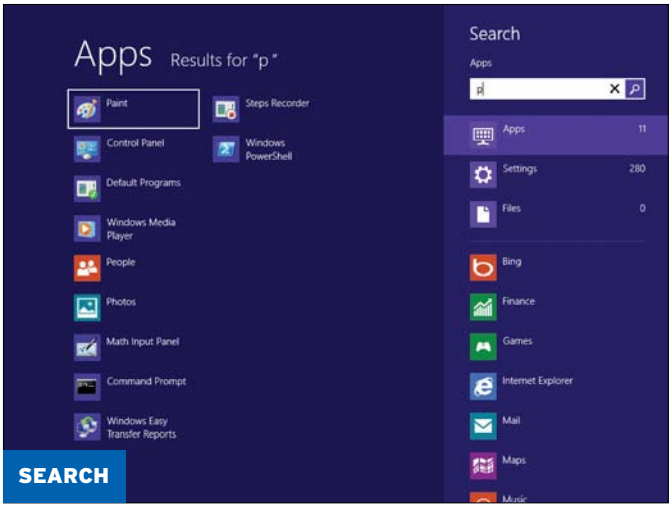
If you like the idea of leaving yourself reminders on the screen of your computer, then Sticky Notes is for you. You'll find it by searching in the Start menu or screen. When you run Sticky Notes, a blank sticky note appears on-screen. Just type whatever reminder you want into it; if you want to change the colour of the note, you'll find the relevant options by right-clicking. Click on the + sign to create another sticky note.



STICKY NOTES

Search on Windows 8 Start screen

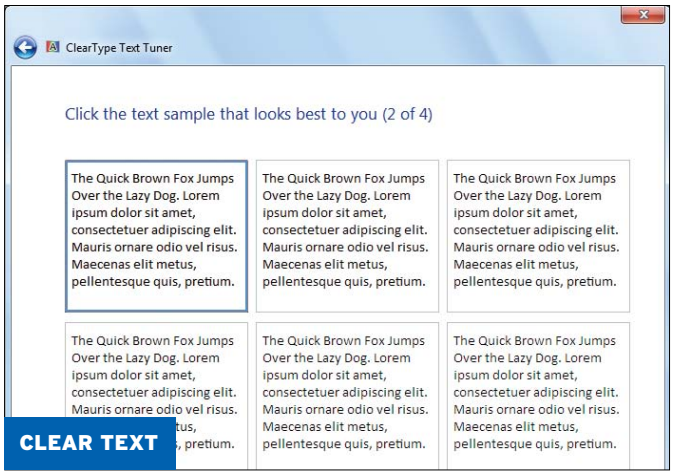
You can search for applications or documents in Windows 7 by using the search box on the Start menu but in Windows 8 searching is easier still. So long as you're in the Start screen, just begin typing the name of a document in a library or an application and the search box will appear automatically.



SEARCH

Make text pin-sharp

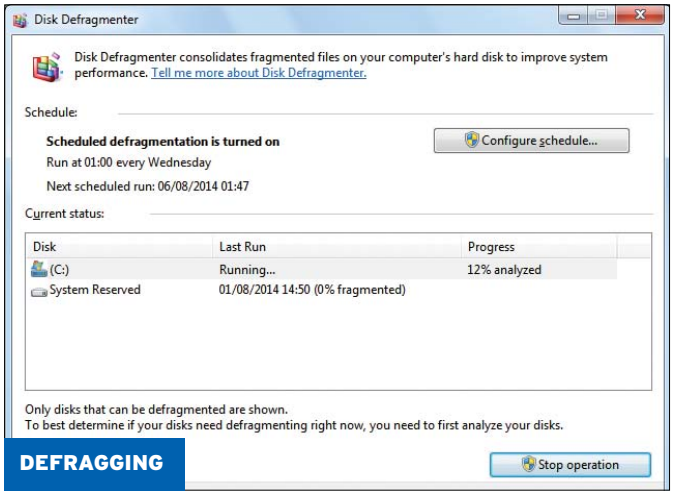
Windows provides a utility to fine-tune text to match your display. This is called the ClearType Text Tuner, and unless you've made use of it your text won't necessarily be as sharp as it could be. You'll find the utility at Control Panel > Appearance and Personalization > Fonts > Adjust ClearType text.



CLEAR TEXT

Defrag your disk

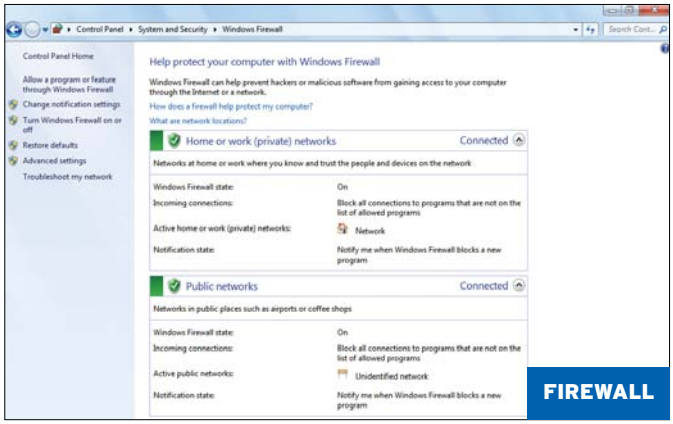
Although there are lots of things that can slow down your PC and make Windows slow to start, one of the easiest to sort out is fragmentation of the hard disk. You don't need any third-party tools to do the job either, since Windows provides all you need. It could take quite some time, though, and it'll affect performance while it's running, so set it going when you're not going to be using your PC. Just search for Disk Defragmenter in the Start menu.



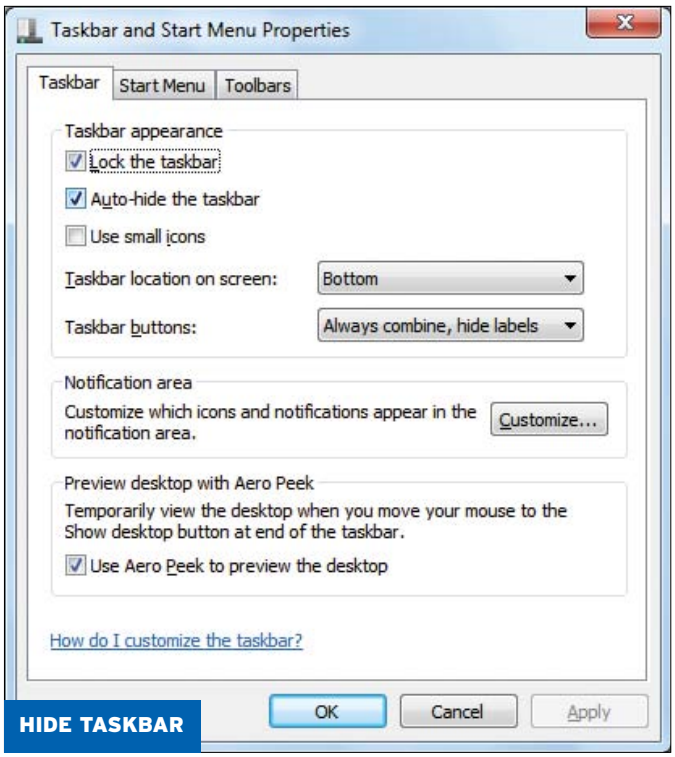
DEFRAGGING

Don't take a risk

The Windows firewall protects your PC from malicious attention over the internet. Normally it's turned on but you might have turned it off, perhaps because you thought it might have been responsible for something not working correctly. If you forgot to turn it on again, then your PC could be at risk. Turn it back on again at Control Panel > System and Security > Windows Firewall.



FIREWALL



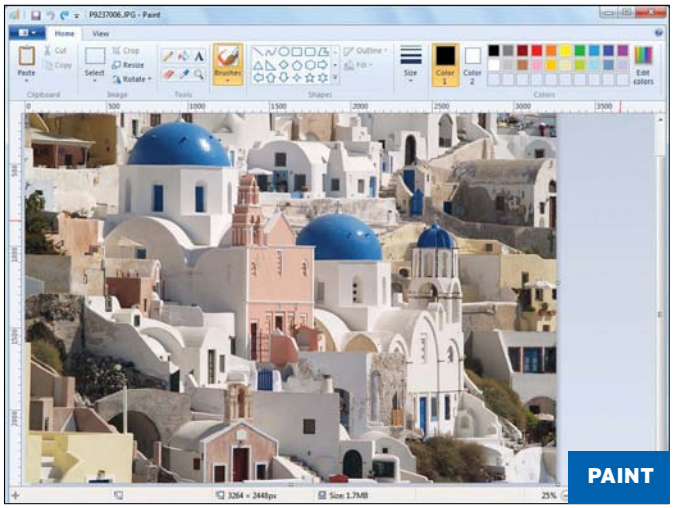
HIDE TASKBAR

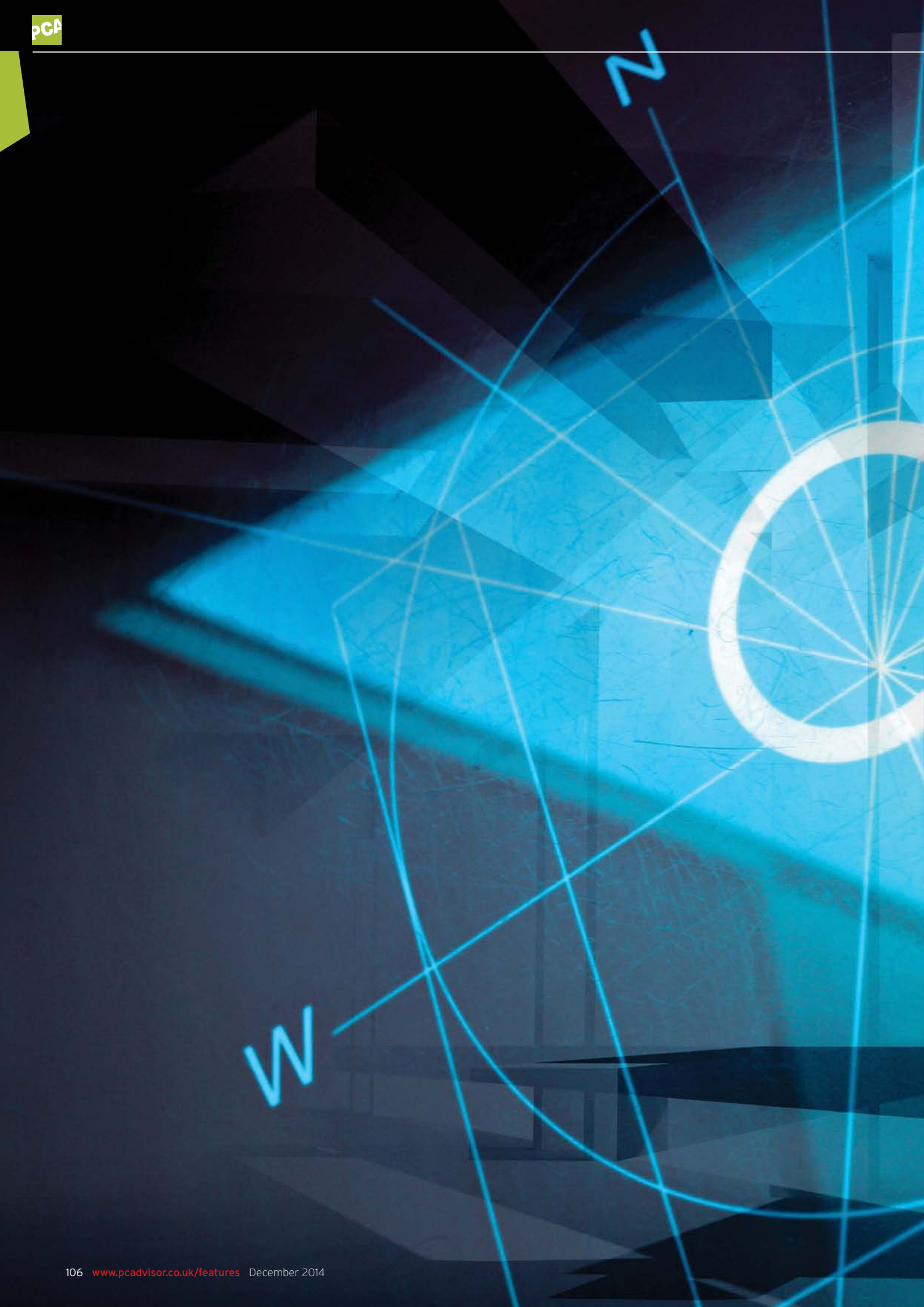
Hide the taskbar

Sometimes you need the absolute maximum amount of screen space available. The taskbar at the bottom of the screen uses valuable space that you might want to put to better use. To hide it, right-click on the taskbar and select Properties to display the Taskbar and Start Menu Properties dialog box. On the Taskbar tab, select 'Auto-hide the taskbar'. The taskbar will now disappear; when you do need it, just moving the cursor to the bottom of the screen will summon it.

Don't forget Paint

It might not be as sophisticated as third-party photo editing software but don't forget that Windows comes with its own graphics package, Paint, and it's a lot more sophisticated than it used to be. Use it for editing photos from your smartphone (it's a lot easier than using photo editing apps on a small screen) of for creating your own unique Windows wallpaper. ☒


PAINT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BEST APPS FOR NAVIGATING INDOORS

We all use satnavs, but they don't work indoors. Bianca Wright investigates some apps and new technology that could help us find our way round airports, shopping malls and any large buildings

It's a first-world problem, but a problem nevertheless: How do you navigate an indoor space when GPS does not work? While it may not yet be ideal, as with everything these days, there's an app for that – or rather several apps.

President of the Royal Institute of Navigation, Dr Roger McKinlay, explains why GPS does not work for indoor navigation: "The stumbling block with indoor GPS is normally the rather unhelpful and superficial comparison with phone signals. Whereas with a phone the information you're interested in is in the signal, with navigation it's not the content of the signal which is of interest but how it gets to you." He adds that retransmitting a phone signal with a suitable repeater greatly improves coverage, but retransmitting a navigation signal destroys the bit you are interested in.

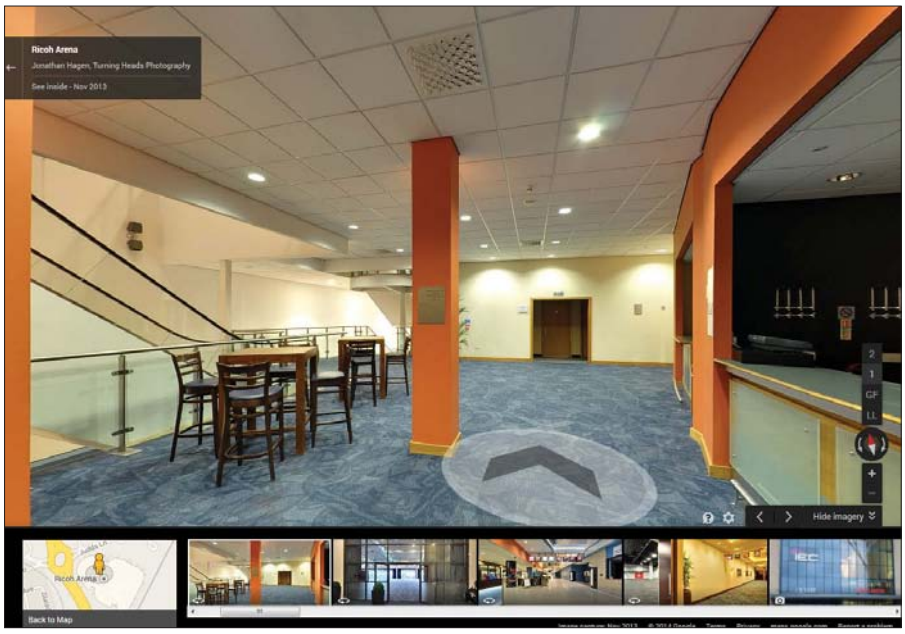
This means that tech companies have been looking for other ways to make indoor navigation work. The mobile app, so ubiquitous across almost all aspects of life, is one such way. Apple has realised the potential of such an approach and is assisting app developers to better leverage the potential applications in iOS 8. The new CoreLocation version will use Wi-Fi and the device's sensors as well as tapping into data from the location to provide a better indoor location-based service that could include mapping.

Start-ups across the world are also looking seriously at the potential of indoor navigation. Inside, for example, is an app developed by Israeli-based developer ShopCloud. It's free for both users and venue owners, requires no additional hardware and can even function when the smartphone is in Airplane mode. It's still in beta at the moment, but represents part of an exciting developing environment that will see us better able to find our way around indoor venues.

The applications are not only commercial. Think of the possibilities for hospital patients needing to find their way to a specialist appointment, or visitors to the hospital accessing an app to help them locate their loved one. Universities are also looking at options so that students and guests can find classes and offices quickly and easily.

McKinlay adds that potential uses move beyond human applications. "Do you want the mall floor sweeper to be driverless? Does the robot need to know where it is or does it just follow the walls and avoid bumping in to people?" he asks. There are numerous possible ways to use these solutions.

MAPP creates 3D maps for visitors to shopping centres, so they don't get lost



So what's out there right now in terms of indoor navigation apps? The truth is, not that much, but they are starting to develop. One of the constraints is that many of these apps are linked to specific venues, such as a museum or a shopping centre, rather than functioning as an indoor version of the more generic GPS system.

Mally

Navigating the maze of corridors and levels in a shopping centre can be frustrating, so an app that helps you find your way is a good idea. Using computer vision and 3D technology, Mally creates 3D maps of the mall for users. The app itself is quite nifty, allowing you to view a 3D map, a 360-degree view, plot your route and also to access lists of shops, events, offers, and floors.

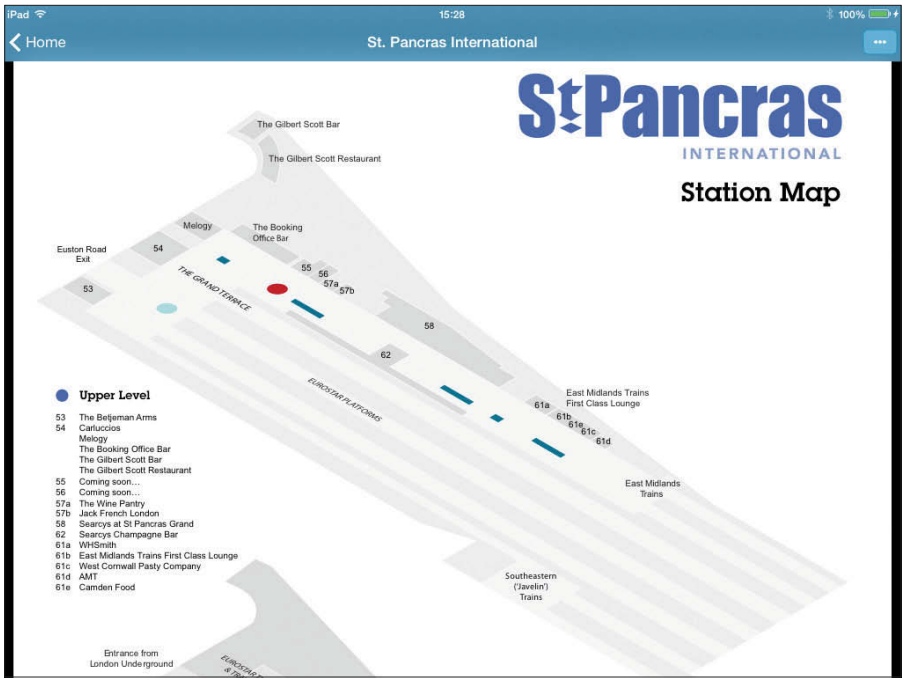
GOOGLE INDOORS uses the same interface as Google Maps

Unfortunately, in the UK it's only available for the Weston Favell Shopping Centre in Northampton. Spain has a much better range of malls. If Mally were to be rolled out to other sites across the country, it has great potential thanks to it's user-friendly interface.

It's available for iOS and Android devices.

Indoor Maps

Google has been in the indoor navigation game for a while, though, it hasn't quite found its feet. It's reliant on businesses uploading floor plans and maps of their indoor locations to Google Maps and offers a static view rather than an interactive one,



but it's one way of finding your way around selected venues. The 'You are here' icon provides some navigation features.

To access an indoor map, you'll need to zoom all the way into a venue to see a map of its interior. In some mapped venues, you can also see an almost three-dimensional view of parts of the interior constructed with photographs and 'walk' through it.

Google Indoors only works for selected venues, but there is a good list of UK-based places that are mapped, including major airports, certain train and underground stations, and museums. Stores such as B&Q and House of Fraser also have Google Indoor Maps for some of their stores. A full list of UK venues that can be viewed is available at: tinyurl.com/pp9b3ju. You will need the latest version of Google Maps.

MApp – UK Indoor Maps

MApp offers a range of maps of theme parks, shopping centres, universities, train and London underground stations, parks, zoos and aquariums, airports, hospitals, and arenas. It uses your location to suggest nearby places that are MApped and provides average distances. You can't navigate through the selected map, but it has a good collection of maps for places you are likely to go. In essence, it's like having access to a database of PDF maps on your phone or tablet. You can download MApp from iTunes.

These give you an idea of what indoor navigation apps currently offer. Going forward, developers need to examine what they want from such solutions. "It's not just about accuracy but reliability and availability. Inaccurate or infrequent services won't be used," McKinlay argues.

He added that navigation does not just need a position but a useful map. "What information do you want on the map? For many people they simply want an extension of what Google tells them about the street outside, and the location of shops and bars," he says. "Google Maps has become completely synonymous with navigating outdoors, but no maps exist for buildings."

While the number of available options is currently limited – and in many cases the functionality is too – indoor navigation solutions, whether apps or other possibilities, seem set to develop rapidly over the next few years, offering new ways to enjoy everything from shopping centres to hospitals and universities.

OTHER OPTIONS

Apps and GPS aren't the only possibilities when it comes to indoor navigation. Here are a few other options:

- Google's Project Tango (pictured right), a prototype smartphone, features a vision processor that will allow it to create 3D maps of interior spaces.

- Apple's iBeacon uses Bluetooth low-energy (BLE) wireless technology to provide location-based services. The iBeacons, low-cost sensors, are installed at a location and provide information to the user's phone. This can be used for indoor navigation, as well as location and context-specific experiences through the mobile device. Virgin Atlantic has trialled the technology at Heathrow.

- Companies such as Virtusa are working on solutions that leverage similar technologies to that of Apple, namely Bluetooth Smart. UK-based app developer Mubaloo is working with Cisco on combining Wi-Fi with BLE beacons to create indoor navigation.

- The research community is also experimenting with different options. Dr Ramsey Faragher of the University of Cambridge is working on a system that uses radio signals, Wi-Fi signals and magnetic anomalies within buildings to provide detailed positioning data.

- CSR, a Cambridge-based semi-conductor company, is developing a two-part system that uses hardware and software elements. Its SiRFstarV architecture has been designed to 'sniff' a number of different radio signals from Wi-Fi to Bluetooth, Cell to GPS, as well as other satellites, including Navstar, Glonass, Galileo and BeiDou-2. It also uses movement sensors, which take over when the traditional radio signals are weak or nonexistent. According to CSR, one of the sensors is a pressure sensor, which is so accurate that it's able to determine the floor you are on in a multistorey shopping centre. The software component is SiRFusion, which allows the various radio signals and sensors to be amalgamated, prioritised and fed into a back end server. This then consolidates all the information and provides an accurate location either indoors or outside.

- Radio navigation is also an option, explains Roger McKinlay. "The frequencies involved in radio navigation can penetrate walls and don't bounce around. Ultra-wideband (UWB) systems have been proposed and tested for firefighters," he says. "A set of masts on vehicles around a building illuminate the building enabling firefighters to find their way and broadcast their locations so others can keep track on them."

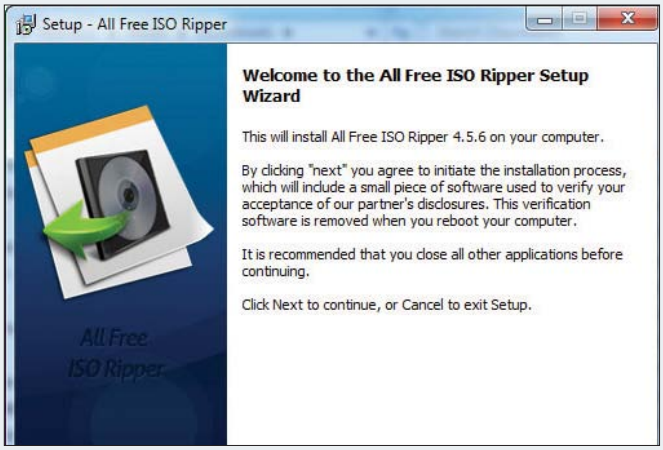
- Adopting a military approach, McKinlay says could use "ded" reckoning. "From a known starting point, the direction of travel and distance travelled can be measured," he says. "This is still the preferred approach for military guidance systems where radio signals might be interfered with. Such autonomous systems have the advantage of not requiring an infrastructure but sensors are expensive. New technologies promise cheap inertial sensors which could form the basis of such systems."

Looking at all the possibilities, McKinlay says: "The answer lies not with integrated systems. When you enter the shopping mall you know your location from your last fix with GPS. You use a mixture of ded reckoning and 'signals of opportunity' to work out where you are. You have a map of the building, some information about the routes other people have taken and also where you went the last time you visited. The most likely platform will continue to be the smartphone."

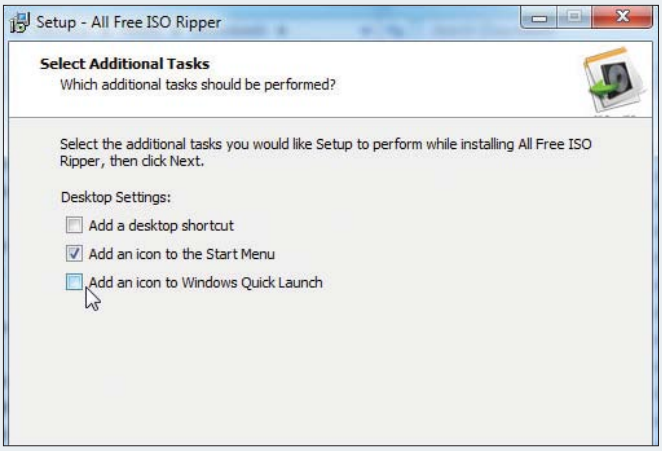
Avoid installing PUPs

PUPs sneak on to your system as accessories to the program you intend to install. Lincoln Spector reveals what to look out for during software installations

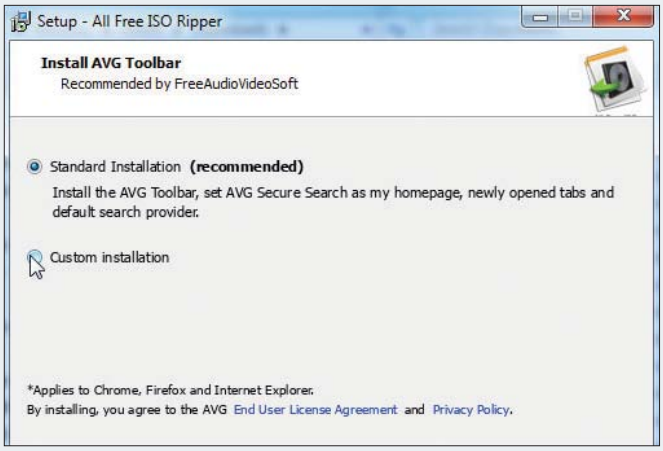
PUPs – potentially unwanted programs – can slow performance, install space-stealing browser toolbars, and even invade your privacy. You don't have to give up free software to avoid PUPs, but you do have to pay attention during the installation, since each PUP first appears as a trap in the desired program's installation wizard. We show you the tricks and traps to look out for during software installations.



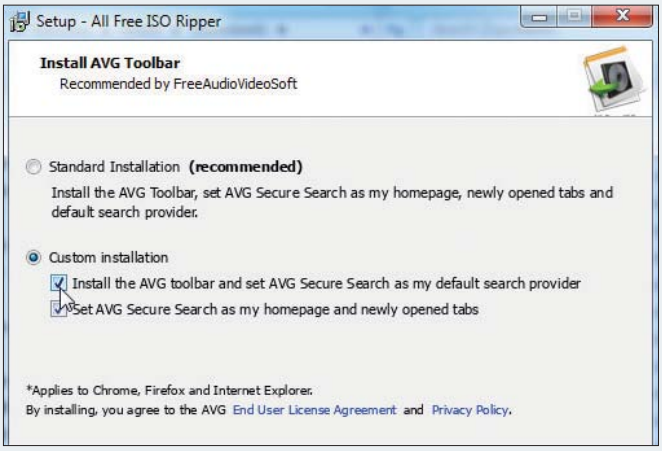
START Recently, I needed a simple program that could convert a video DVD into an ISO file – I opted for All Free ISO Ripper. As I walked through the installation wizard, I found something of a PUP motherload, which makes it perfect for this How To.



2 This second page of the wizard is pretty harmless. The creators of the program even left the desktop shortcut option off by default. Unfortunately, it's the last good thing you'll see from them for the rest of the installation.



3 The wizard recommends you opt for Standard Installation, but check out the top of the window. This isn't about installing All Free ISO Ripper. It's about installing the AVG Toolbar. That's not what you signed up for. Always select the Custom installation option.



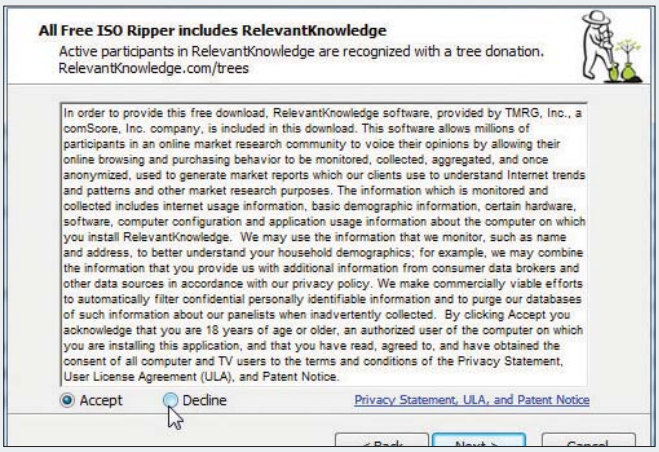
4 This is what you get when you select Custom installation – options that have already been checked. Untick these.

5 The next page in the installation wizard looks a lot like the previous one, except the default is 'Express (recommended)' and the wizard wants to install something called PureLeads. The wizard warns you that the Custom installation is "(advanced).

6 Click on 'Custom installation' and untick 'Install PureLeads'.

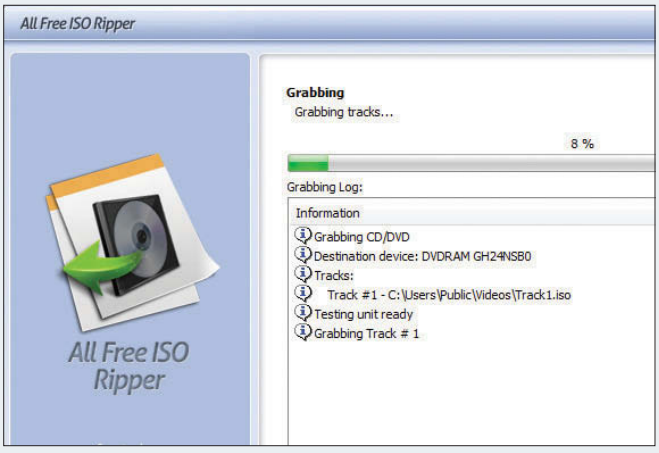
7 I give to various charities and they all want more money. You want to click 'I do not accept', but can't because that option is greyed out. Except it isn't. If you point your mouse to it, you may still be able to select it.

8 If you don't want to install PC Utilities Pro: Optimizer Pro, untick 'I accept the terms of the Optimizer Pro Terms of Use and Privacy Policy'. If you don't want to install a program, you don't have to accept its Terms of Use or Privacy Policy.



9 Before you select Accept, take a second look at this particular EULA. The first sentence mentions RelevantKnowledge as software "included in this download". This isn't the All Free ISO Ripper EULA. Click Decline and go on.

10 Curiously, All Free ISO Ripper doesn't have its own EULA. After I declined the RelevantKnowledge one, the real program installed in seconds.



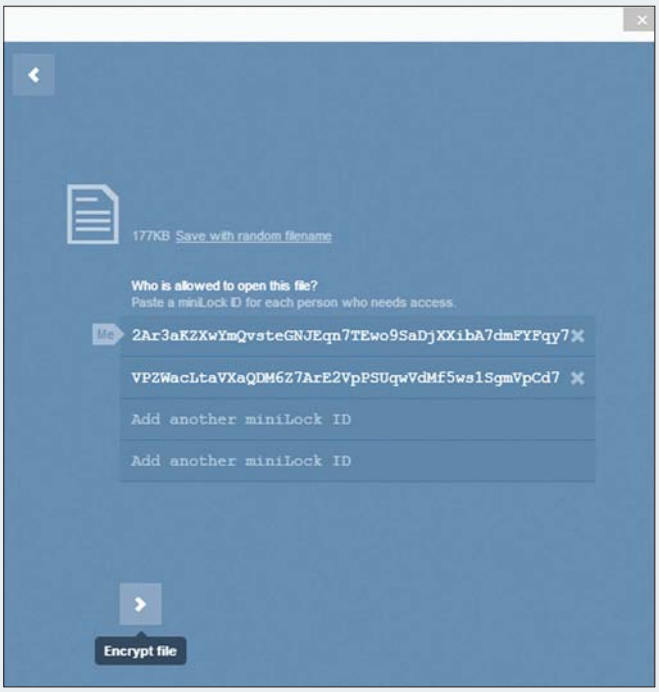
11 When it came to using All Free ISO Ripper, it worked like a dream. That's the thing about free software with PUPs – the installation is tricky, but if you keep a keen eye out for tricks and traps, you can get something good for free. ☒

Keep your files safe and secure with miniLock

The creator of Cryptocat, Nadim Kobeissi, is back with another easy-to-use encryption tool. This time it's a free Chrome app called miniLock that aims to make it easy to create and share single encrypted files with others. Ian Paul shows how it will keep your files secure

Similar to other encryption tools, miniLock relies on public-key cryptography. Under this scheme, you have to share your public key with others so that they can encrypt files meant for you and only you. But unlike many encryption tools, it's very easy to understand and use. The public key itself, dubbed your miniLock ID, is relatively short at around 45 characters. But it's still too long to remember easily, so you'll want to write it down or save it in a password manager such as LastPass or KeePass.

This is what **MINILOCK** looks like once it has generated a public key



You'll see the above image when a file is ready for **ENCRYPTION**

Implementation is key

The encryption scheme that miniLock employs is Curve25519 elliptic-curve cryptography, which is the same type of cryptography that Cryptocat uses. However, the problem with encryption tools often isn't the strength of their encryption, but how well the encryption is implemented.

Judging the quality of the cryptography is beyond the scope of this article. But on the miniLock site (minilock.io), you can find a recent miniLock security audit by penetration-testing firm Cure53. The report gave miniLock a clean bill of health.

For anyone who wants to dive in right away, here's a quick hands-on tour of miniLock on a Windows 8.1 PC.

Generating your ID

To get started, visit the Chrome Web Store (tinyurl.com/p86q7nr) and install miniLock as you would any other Chrome app. Then you can either launch it right from the Chrome Web Store or via the Chrome App Launcher in your taskbar, if you've installed that. When it starts up, miniLock will ask you to sign in with your email address and a passphrase. The app will use this information to generate your miniLock ID, which should take only a second or two.

In our tests, miniLock was fairly picky about passphrases. We tried using a 10-character randomly generated passphrase with capital and lowercase letters, numbers, and special characters. That should make for a fairly solid password, but for miniLock it wasn't strong enough.

Instead, the app suggested that we use one of its auto-generated passphrases, which consist of a series of random dictionary words. To make things easier, we used one of the passphrases generated by miniLock, but you could also write your own. Just make sure it's unique and memorable enough that you won't forget it. Otherwise, storing it in a password manager will be important. As with other encryption tools, if you lose that passphrase, you won't be able to unlock any files sent to you with that miniLock ID.

Now we've shown you how to set up your ID, we'll walk you through how to encrypt a file so you can see how it works. Make sure you back up the test file in unencrypted form just in case something goes wrong.

To choose a file, either tap the file-drop area in the miniLock window or drag a file from File Explorer and drop it in the window. The app's window will then flip around and reveal space for entering up to four miniLock IDs.

By default, your miniLock ID will appear at the top, as you are the person encrypting the file. Below that, you'll have the option to add another three people you want to be able to access the encrypted the file – assuming you have their miniLock ID. If you wanted to send this file to one person and didn't want to have access to it yourself, simply click the X to the far right of your miniLock ID to remove your key.

You also have an option underneath the filename to have miniLock to create a random filename – something you might do if you want to be really secretive about what you're sending.

Once the IDs for every recipient are ready to go, tap the arrow at the bottom of the window to start the encryption process. Depending on the size of the file, it could take a few seconds or a few minutes to finish.

After the encryption is done, the app will tell you "Your encrypted file is ready" in small letters below the filename. Next, click on the filename to save the file to your PC via Chrome's downloads manager.

Now that you have an encrypted file, you can send it to the intended recipients any way you like: email, instant message, USB key, Facebook; the choices are seemingly endless.

Decrypting

Decrypting a file is even easier than encrypting. Once you receive your miniLock-encrypted file via email (or whatever method), download it to your PC and drop it into the miniLock window. As long as you are signed in to miniLock and the file is encrypted with your miniLock ID, the file will be automatically decrypted. Then you can save it to your PC the same way you did with the encrypted file.

That's about all there is to miniLock. The only drawback that some people might find is that you have to sign-in every time you open the app. MiniLock does not save your login across user sessions. That was likely a conscious choice to protect your privacy. Still, some people may find the constant logins to be a drawback. ☒

Start a blog and find the best platform for you

Ever thought about starting a blog? It's a great way to get your voice heard, become part of an online community, or simply keep an online account of your life. It's a fun hobby, but it can seem very daunting when it comes to starting one. Ashleigh Allsopp talks you through how to start a blog and share some blogging tips.

Choose a subject

Obviously, the first thing you'll need to decide is what your blog is going to be about. Mine is a blog about books (ashleighonline.com), but you can blog about anything. It's important to choose a subject that you're particularly interested in, and that you'll enjoy writing about, because it's no fun if blogging begins to feel like a chore.

What's the best blogging platform?

Once you're confident that you've chosen what you want to blog about (you'll need to pick a catchy name for your blog, too), you can start thinking about the blogging platform you want to use.

There are lots of blogging platforms with varying different benefits. For casual blogs there's Tumblr, but it's more of a social network that seems to be more popular with 'fandoms' (that's what they're calling groups with a particular obsession with a celebrity, band film series, book, and so on. Members of the Harry Potter fandom call themselves 'Potterheads', for example).

If your blog is going to be about One Direction, Tumblr is probably a great place to start your blog, but if you're writing about politics, travelling or technology, we'd suggesting looking elsewhere. Lots of artists use Tumblr as their blog to show off their work, though, because tagging is prevalent and there's a strong emphasis on images.

If you do start your blog on Tumblr, there are migration tools to help you transfer it to WordPress or Blogger, so you'll be pleased to hear that it's not a decision that's set in stone.

On to Blogger now, which is owned by Google. It's free to host your blog, though, you'll need to sign up to Google to begin. One of the things I don't like about Blogger is that compared with WordPress it looks outdated. On the plus side, it offers AdSense for free, which could earn you a few extra pennies, and you also get analytics, which will help you track how many people are reading your posts, though, you get this with WordPress, too.

Again, there are ways to migrate from Blogger to WordPress at a later date if you eventually decide it's not right for you. Blogger is definitely dropping in popularity among new blogs, though.

Next up is WordPress.com, which is where I host my blog. Like Blogger, it's a free blog-hosting site that offers analytics and a simple and intuitive interface that you'll be able to master in next to no time. We much prefer the various themes that are available for

WordPress.com blogs over those available for Blogger, as they tend to look more professional.

It's easy for readers to follow your blog on WordPress too, and for them to Like and comment on it. Both Blogger and WordPress offer options that allow you to host your blog with a domain name that doesn't have the .wordpress.com or .blogger.com portion on the end, so if you're happy to pay around £10 per year that's definitely an option worth considering. If you already own a domain name, you can map it to your WordPress or Blogger blog, too.

The final option is WordPress.org, which is for serious bloggers and websites and is one of the most popular blogging platforms out there. It's similar to WordPress.com, but you'll have to download the free software on to your computer. You'll also need to get your own domain name and web hosting sorted, by turning to a company such as 1&1, GoDaddy or 123-reg, which will charge you a few pounds per month for the privilege.

With WordPress.org you'll get everything that WordPress.com offers, and more. For example, you'll have greater control over your blog, which is the real benefit here, though, it can be time-consuming and sometimes a bit confusing if you're new to it. There are hundreds (probably thousands) of different themes for you to choose from, but many of the best ones will cost you. You'll be able to add plug-ins to your site for extra functionality, too.

Below right is a basic WordPress.org site I set up with friends a few years back: levelinfinity.co.uk. We've been too busy to keep it up of late, but it's a simple example of what you can achieve with very little effort on the web design/building side of things.

There are many other blog hosting sites out there, but those are the four most popular. When you've decided which you're going to use, you'll be able to sign up and follow the (generally very simple) instructions to actually get your blog up and running.

Content

When you first start a blog, it will look rather empty right, so you'll need to start thinking about what you're going to write. It's a good idea to set up an 'About' page on your blog to explain who you are and what the blog is going to be about. You can also share contact information here if you want to encourage readers to reach out to you. You'll then want to write a blog post or two on your chosen subject. Be sure to include images to make your post more visually appealing. It's a good idea to visit other related blogs to get some inspiration, too.

You might want to think about a blogging schedule, too. I try to post on my blog every weekend, because that's when I'm free and my readers tend to be looking for new blog posts to read, but if you've got more time on your hands you might be able to blog something twice a week, or maybe even every day. As you build up followers and readers they'll get used to your schedule and will start to look forward to your posts on those days.

Use social media

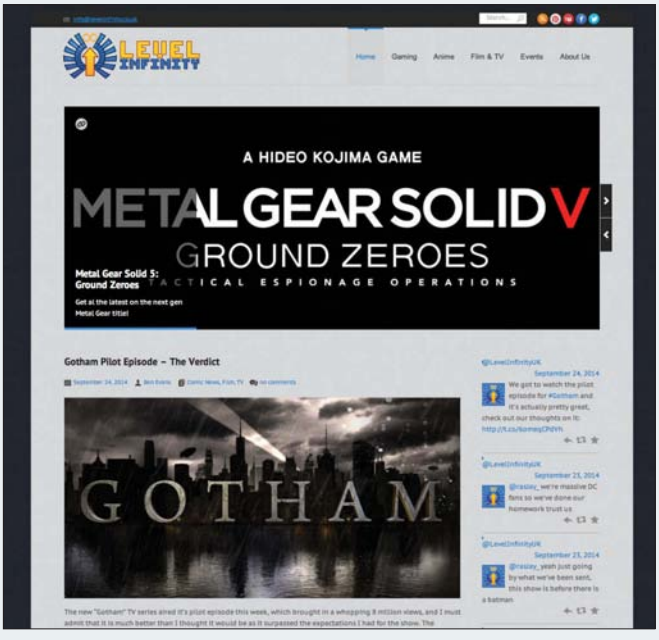
So now that you've got some content on your blog, you'll need to start spreading the word. I use my personal Twitter and Facebook accounts to share my blog posts, but if it suits your blog you might want to start a brand new, dedicated Twitter account and Facebook page. Social media is key to blogging. You'll want to use Twitter to communicate with other bloggers and your readers, but also relevant brands and companies that you might be blogging about. You might also begin to find collaboration opportunities with other bloggers, or be asked to write a guest post on another blog for some extra publicity on both parts.

What to expect (and what not to)

One final thing to say before you start your blog is that you should make sure you haven't set your expectations too high. There are millions of bloggers out there, and even some of the best don't make money from it, so you won't earn much cash (or any).

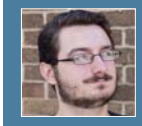
You should also expect your traffic to be quite low, at least to begin with. It takes a lot of time and effort to build up an audience, so if you only get a few visitors a day to begin with it doesn't mean you're doing a bad job! Patience is key.

Most importantly of all, if you're setting up your blog as a hobby (rather than as a means to promote a business, and so on), then it should be fun. Don't let it bog you down: if you don't have time to post one day, don't. ☒



LEVEL INFINITY is a basic site that was set up using WordPress

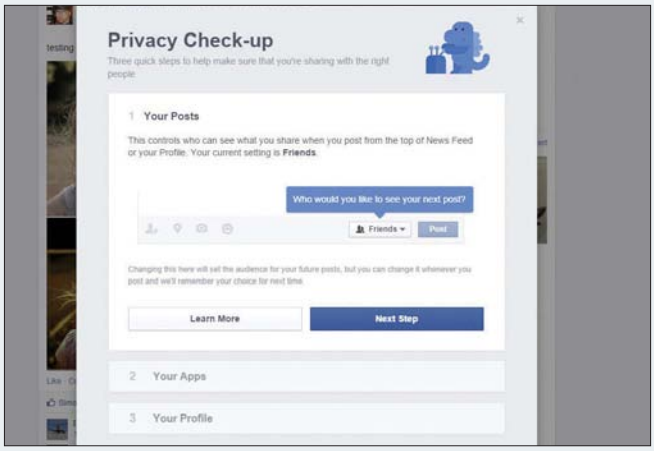
Make Facebook private



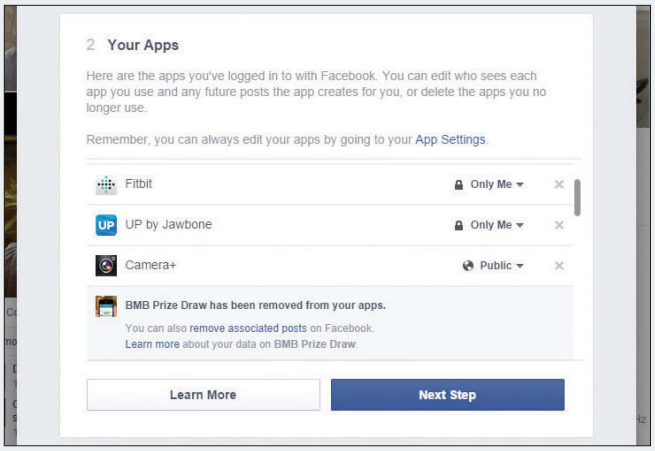
If you're concerned about who's viewing your Facebook posts, you'll want to make use of the new Privacy Check-up tool. Adam Shepherd explains how

Facebook is a great tool, and can be a lot of fun, but sometimes you don't want everyone on the internet to see what you post there. Luckily, Facebook has released a 'Privacy Check-up' tool that provides a simple way to ensure that no-one's seeing your details unless you want them to. If you're worried about a potential employer seeing your embarrassing selfies, or about your grandmother seeing what you really get up to at the weekend, here's a step-by-step guide on how to make Facebook private, as well as how to unfriend people.

START Go to Facebook.com and click on the small icon that looks like a padlock to open a set of privacy shortcuts. Click the first option to open the privacy wizard – this lets you change which parts of your profile (if any) are visible to the public.

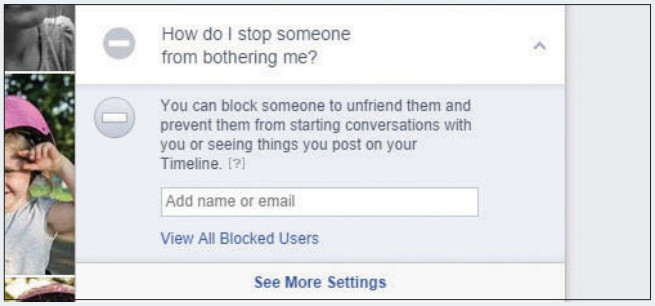


2 The first option is to control who sees the status updates, photos and location check-ins that you post. The box will either say 'friends' or 'public', and clicking on it will open a drop-down menu where you can select the desired setting.

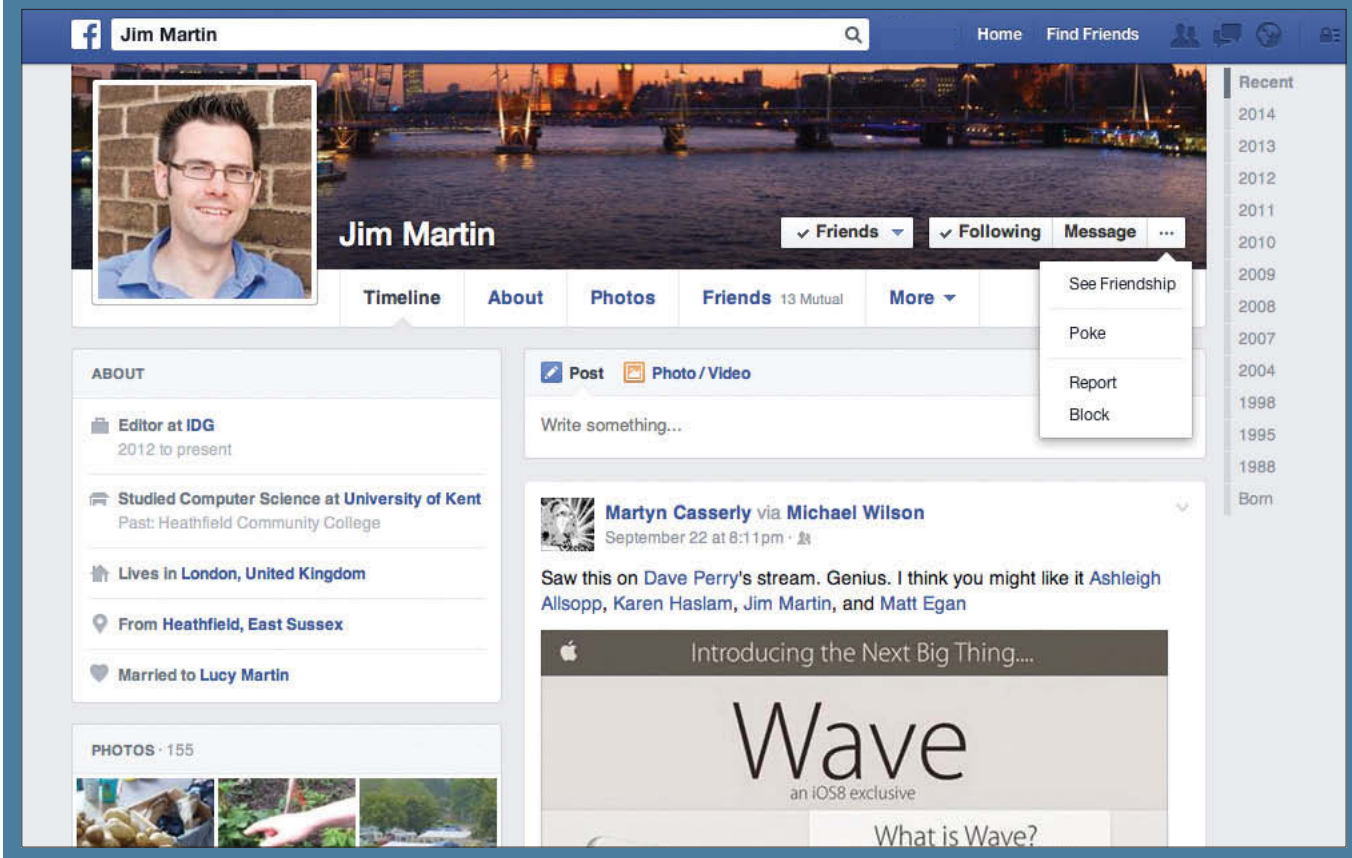


3 Click on 'next step' to move on to modifying the settings for any apps associated with your Facebook. Here, you can open a drop-down menu to modify who can see each app, as well as any posts that the app might make to your timeline.

4 The final stage is your 'about' section, where it lists any details you've added such as your old school. Next to each of these is another drop-down menu – use it to change your profile's settings. Click the Finish button when you're done.



5 If there's anyone you specifically want to prevent from contacting you or seeing your information, you can unfriend them by clicking on the same icon used to open the privacy settings. Next, click on the fourth option, labelled 'how do I stop someone from bothering me?' This will open a box where you can enter the name or email of the user you'd like to avoid. Finally, click the 'block' button. ☒

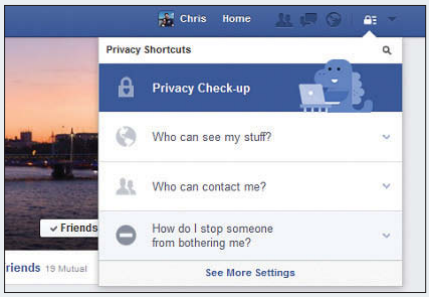


Unblock someone on Facebook

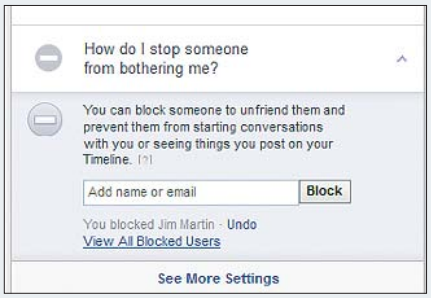
Facebook is a powerful tool and great way to keep in contact with friends and family. It does, however, have its downsides and you might have blocked people when they get a little too annoying. But what if you want to reverse that decision? Chris Martin shows how to unblock someone on Facebook

Before you being the process it's worth noting that unblocking someone will not automatically add the person back to your friends list. If you want to become friends with this person again, you'll need to send them a new friend request. In future, an easier way of not seeing someone's annoying posts is to unfollow them rather than blocking them. To do this, untick the following box within the cover photo area of their profile.

START Click the padlock icon in the upper-right corner of your homepage and select 'How do I stop someone from bothering me?'.



2 Now select 'View All Blocked Users'.



3 Click the 'Unblock' button next to the name of the person you want to unblock and confirm in the next box.

4 You've now unblocked that person and can send them a new friend request. ☒

Use a Micro-USB cable with an iOS device

When Apple introduced the proprietary Lightning connection to its range of iPhones, iPads and iPods, it made laying your hands on a compatible cable a pain. Marie Brewis reveals how to charge or connect your iOS device to a computer with a Micro-USB cable.

How to convert Micro-USB to Apple Lightning

When Apple changed the proprietary connector from the 30-pin dock to Lightning on its iPhone 5, iPad 4 and fifth-generation iPod touch, for many users it meant yet another cable to carry around, especially if they were also using older Apple products and/or an Android smartphone or tablet.

Given that Apple charges £15 for its official USB-to-Lightning cable, you probably have just the one Lightning cable – the one that came with your iOS device. This also means it's probably at home, attached to your wall charger, and never where you need it when you need it. Ask someone in the office to lend you an iPhone cable and you can almost bet that they will pull out an old-style 30-pin dock connector cable.

Wouldn't life be so much easier if you could charge or connect to your computer your iPad, iPhone or iPod using Micro-USB? These cables are never in short supply, bundled with everything from Android phones and Android tablets to Bluetooth speakers and headsets, external hard drives, portable USB chargers... the list goes on. I have a drawer full of them. Fortunately, all you need to get your iOS device working with Micro-USB is a tiny adaptor that can convert Micro-USB to Lightning.

We like Inateck's EC2001L 2-in-1 Micro-USB Cable with Apple Lightning Adaptor 1.2m (pictured right). It costs £9.99 from Amazon, which might sound pricey, but don't forget Apple charges £15 for its official Lightning cable. And it's incredibly useful.

The EC2001L is sold as a 1.2m Micro-USB cable and a small Lightning adaptor that fits over the Micro-USB connector. You can use it with any Micro-USB cable. Its flat design makes it less prone to damage, and at 1.2m the cable is long enough to reach to the furthest USB ports on your PC or Mac. If you use a mixture of Windows Phone, Android and Apple products, the EC2001L will let you charge any of these devices using a single USB cable. Plus, carry the Inateck connector with you and you'll be able to hook up your iOS device wherever you go.

It's compatible with any device with a Micro-USB connection, plus the iPhone 5, 5c, 5s, 6 and 6 Plus iPad with Retina display and iPad Air, iPad mini and iPad mini with Retina display, the fifth-generation iPod touch and seventh-generation iPod nano. ☒

Safely store photos

Worried that the photos on your iPhone could be stolen and appear on the web? Karen Haslam reveals how to stop them getting into the wrong hands

In recent months, the papers have featured stories of stolen photos appearing on the internet. The risk is, of course, greater if you are a celebrity, but it could be equally risky if a spurned lover or your arch-nemesis got their hands on your snaps. After nude photos of Jennifer Lawrence and around 100 big-name stars including British model Cara Delevigne, Cat Deeley and Rihanna made their way on to image bulletin board 4chan – reportedly obtained from their iCloud accounts – many were left asking just how secure is Apple's storage service. What should you do to make sure the same thing doesn't happen to you? Here we look at how you can stop your photos getting into the wrong hands.

START First things first, if you don't want there to be a risk of embarrassing photos getting out into the public domain, don't take them in the first place. There are, however, other things you can do to keep your images secure.

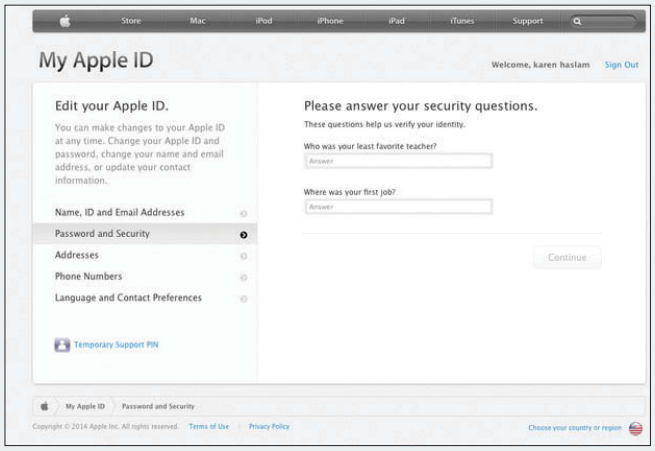
You might think that when you delete a picture that's it, but if you have Photo Stream activated on your iPhone those images will still be on your iCloud account. To disable this feature on your iPhone go to Settings > iCloud > Photos, and turn off My Photo Stream.

2 Another option is to turn off Photo Sharing. To do so, go to Settings > iCloud and switch it off. It will warn you that all your shared photos will be deleted. The next time you want to share an image, do so via email or iMessage, or on a social media account. Remember that duplicates of those images will be stored somewhere other than on your device.

3 If you've switched on iCloud Backup on your iPhone, the images it holds are sitting in iCloud in the form of a backup archive. If someone gains access to that backup, they will also gain access to all your images and movies. To stop the device creating such a backup, tap Settings > iCloud > Storage & Backup and disable the iCloud Backup option.

It is, however, possible to keep on backing up to iCloud without backing up your photos. Tap Settings > iCloud > Storage & Backup > Manage Storage, then tap on the relevant backup and deselect Camera Roll.

4 You should note that even after you've turned off the back up those backup files still exist on iCloud. To remove them, navigate once again to Settings > iCloud > Storage & Backup, tap Manage Storage, and in the resulting screen you'll see a list of backups. Tap any that you wish to delete and on the next screen tap Delete Backup.



5 Make sure you have a good strong password, as well as difficult to guess answers to your security questions and enable two-factor authentication to make your account as secure as possible. ☒

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LETITIA AUSTIN

G Data Total Protection 2015

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FULL PROGRAM (THREE-MONTH LICENCE) AVAILABLE ONLY ON THE DISC+

Installation details

Go to My Computer, right-click the DVD icon and open the disc. Next, select Files 233\G Data Total Protection 2015 and then open the install file

Online registration required: Follow the links during installation before 14 Jan 2015

System requirements

Windows Vista/7/8 (32-/64-bit); 1GB RAM; Windows XP SP2 or higher (32-bit); 512MB RAM

This all-round, worry-free package offers an Antivirus module, firewall and encryption for maximum data protection.

Indeed, security doesn't get any better. G Data Total Protection not only reliably protects you against viruses, Trojans, spyware and hacking, but thanks to the numerous extras such as encryption of your personal data or reliable device control, you are also completely safe from every other threat.

New in this version is comprehensive exploit protection, which safeguards your PC against malware that targets and exploits security vulnerabilities in your installed software.

FEATURES

- Take advantage of the high detection rates
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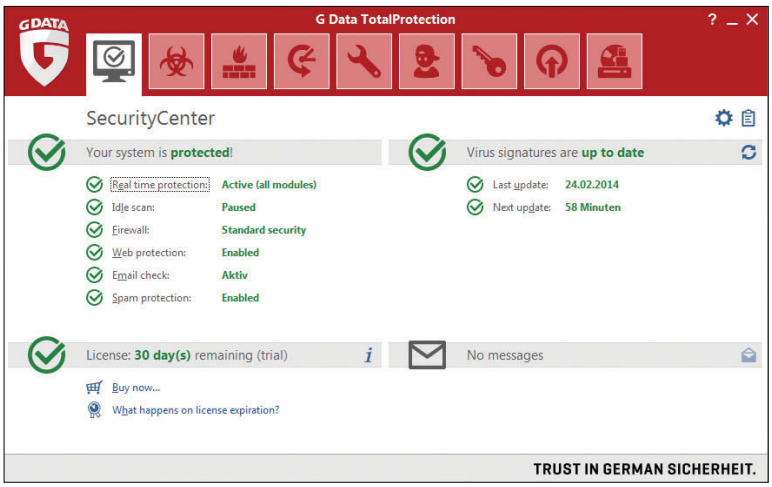
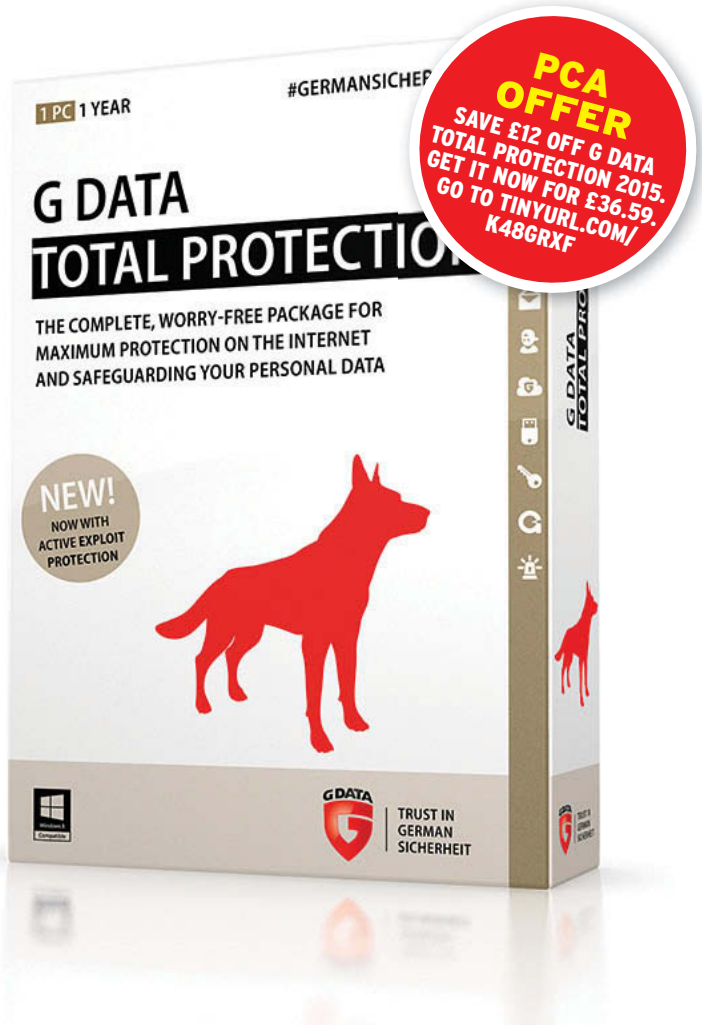
- Protect yourself against online fraud and data theft
- Protect your personal data, even on social networks
- Save time through simple installation and use
- Speed up the boot process
- Protect your children from inappropriate websites
- Delete sensitive files without leaving a trace, with just one click
- Back up all your data with automatic Cloud backup ☒





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Steganos Privacy Suite 15

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Installation details

Go to My Computer. Right-click the disc icon and open the disc. Select Files 233\ Stegano Privacy Suite 15 and open the file

Online registration required: Follow the instructions here tinyurl.com/ppz5g7q before 14 January 2015

System requirements
Windows XP, Vista, 7 and 8 (32-/64-bit)

Steganos Privacy Suite offers complete protection for sensitive data on your computer, removable media devices and smartphones. Anti-virus software isn't enough these days. Because of unsafe operating systems, internet criminals and spies, or simple carelessness, your data may be at risk. That's where this comprehensive privacy package comes in.

NEW: With further reinforced encryption: The AES-XEX method used in Steganos Safe protects you from identity thieves and spies, even intelligence agencies. Now with 384-bit protection as per the IEEE P1619 Standard.

NEW: Dropbox-Safe 2.0: Now you can protect the entire contents of your Dropbox – in real-time, at no extra cost. For perfect protection in the cloud.

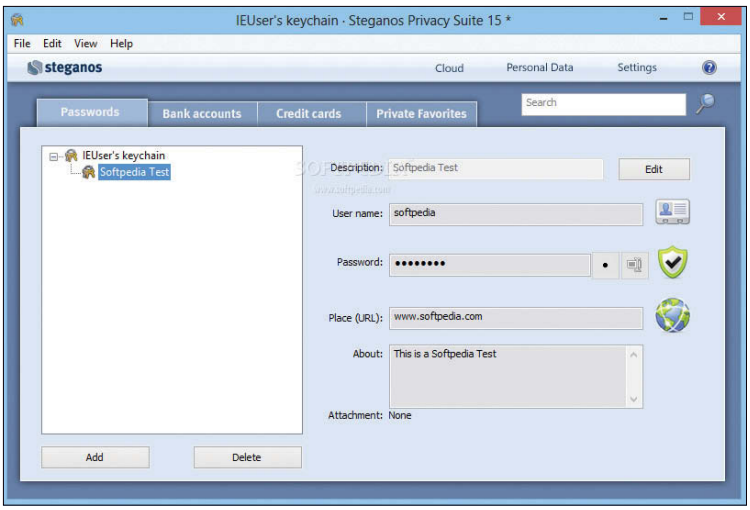
NEW: Simplified Steganos Portable Safe: This is great for backing up to USB flash drives, portable hard drives, CDs, DVDs, or Blu-ray disks

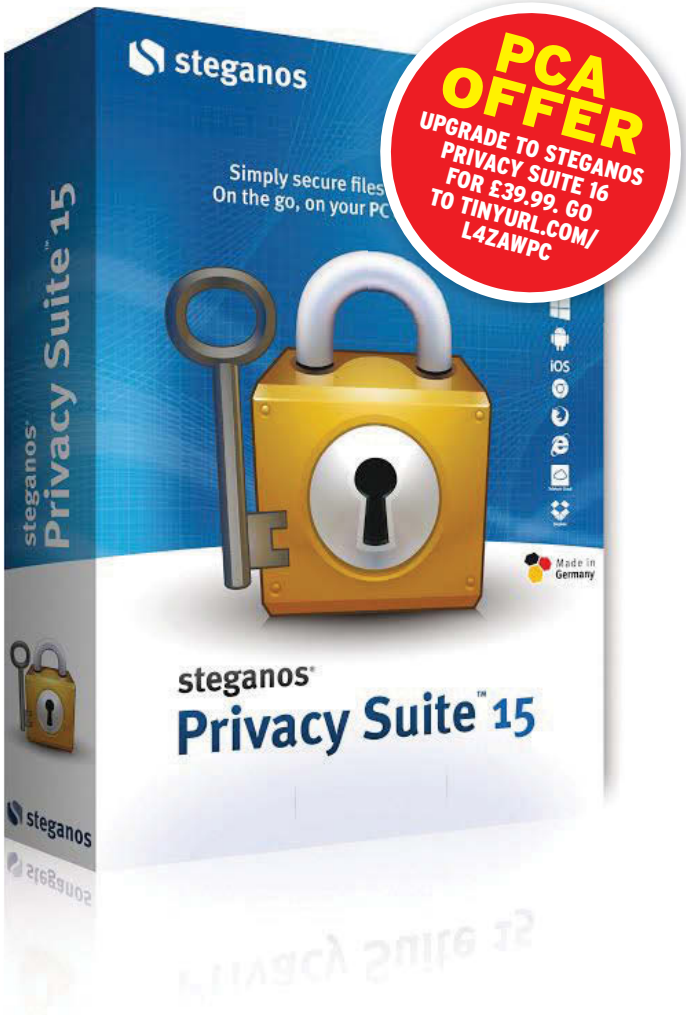
NEW: Steganos Password Manager: Protect your passwords on your PC and smartphone. Now supporting the Telecom Media Center for smartphone connection to German data protection.

NEW: Automatic registration of login data in Chrome and print function for deposit of password lists into a notary or bank vault.

PLUS:
Mailbox Safe: Without the correct password, no one will gain access to your email (supports Outlook, Outlook Express and Windows Mail, only on 32-bit Windows systems).

Steganos email encryption, **Steganos Shredder** (erases files beyond recovery) and **Steganos Crypt & Hide**, to hide sensitive data in pictures and music. ☒





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ABBYY PDF Transformer +

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System requirements

Windows Server 2003/2008 R2/2008/2012 /XP/Vista/7/8;

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Ashampoo Photo Converter 2

ONLINE REGISTRATION REQUIRED

FULL PROGRAM AVAILABLE ONLY ON THE DISC+

Installation details

Go to My Computer. Right-click the disc icon and open the disc. Select Files 233\Ashampoo Photo Converter 2 and open the file

Online registration required: Follow the links during installation before 14 Jan 2015

System requirements

Windows XP/Vista/7/8; 256MB RAM; 37MB drive space

Ashampoo Photo Converter 2 is your Swiss army knife to process your photos. No more manual sifting through heaps of photos, the program processes entire collections in one go, whether it be one or 1000 files. It requires little system resources, which makes it ideal for both current (multi-core support) and older machines. Get results quickly. With Ashampoo Photo Converter's no-frills user interface, you will see results in a matter of seconds. Convert, align, resize or apply sophisticated colour manipulations. There's no need for expensive image editors because Ashampoo Photo Converter 2 covers all these common image tasks.

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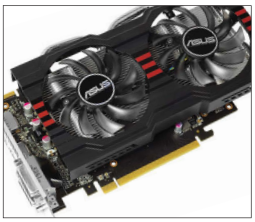
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Flat-panel displays

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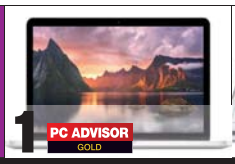

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Website	Apple.com/uk	Apple.com/uk	Hp.com/uk	toshiba.co.uk	Acer.co.uk
Launch date	Feb 14	Apr 14	Sep 14	Aug 14	Jun 14
Build rating	★★★★★	★★★★½	★★★★½	★★★★½	★★★★☆
Features rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★½☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★½	★★★★☆	★★★½☆	★★★★☆
Overall rating	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★★☆
Processor	2.8GHz Intel Core i5	1.4GHz Intel Core i5	1.6GHz Intel Core i5-4200U	1.8GHz Intel Core i7-4500U	1.6GHz Intel i5-4200U
RAM	8GB DDR3L	4GB DDR3L	8GB DDR3	8GB DDR3	4GB DDR3
Storage	512GB SSD	128GB SSD	256GB SSD	256GB SSD	500GB Hybrid
Screen size	13.3in glossy (anti-glare)	13.3in glossy (anti-glare)	13.3in glossy	13.3in glossy	13.3in glossy touchscreen
Screen resolution	2560x1600	1440x900	1920x1080	2560x1440	1920x1080
Graphics	Intel Iris Graphics	Intel HD Graphics 5000	Intel HD Graphics 4400	Intel HD Graphics 4400	nVidia GeForce 735M GT
Video memory	N/A	N/A	N/A	N/A	1GB
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11b/g/n/ac	802.11a/b/g/n
Ethernet	Optional	Optional	None	None	10/100
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	2x USB 3.0	2x USB 3.0	3x USB 3.0	2x USB 3.0, 1x USB 2.0
FireWire	×	×	×	×	×
Thunderbolt	✓	✓	×	×	×
DisplayPort	×	✓	✓	×	×
HDMI	✓	×	✓	✓	✓
DVI	×	×	×	×	×
VGA	×	×	×	×	×
eSATA	×	×	×	×	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	HD webcam, multitouch trackpad, backlit keyboard	HD webcam, multitouch trackpad, backlit keyboard	1080p webcam	720p webcam	None
Operating system	Mac OS X 10.9 Mavericks	Mac OS X 10.9 Mavericks	Windows 8.1 64bit	Windows 8.1 Pro 64bit	Windows 8.1 64-bit
Bundled software	iLife 11	iLife 11	None	None	Acer bundle
Fear (Max detail)	Not tested	Not tested	31fps in Stalker (720p)	17fps (1080p)	62/34.5fps
Battery	71.8Wh lithium-polymer	54Wh lithium-polymer	51Wh lithium-ion	52Wh lithium-polymer	36.4Wh lithium-polymer
Battery life	9 hrs 55 mins	12 hrs 57 mins	7 hrs 30 mins	7 hrs 10 mins	5 hrs
PC Mark 7 score	Not tested	4602	5006	5100	4282
Dimensions	314x219x18mm	325x227x4-17.5mm	324x220x15mm	316x207x19.8mm	324x255x18mm
Weight	1.57kg	1.35kg	1.52kg	1.26kg	1.65kg
Warranty	1-year return-to-base	1-year return-to-base	2 year return-to-base	2-year onsite	1-year return-to-base
FULL REVIEW	TINYURL.COM/M3TNC29	TINYURL.COM/KNXWZW3	TINYURL.COM/N4CJQL9	TINYURL.COM/QHP9F9T	TINYURL.COM/QFGQOOP

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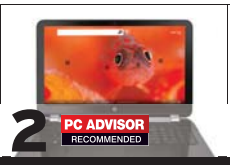
Sub-£500 laptops

	1	2  PC ADVISOR RECOMMENDED	3	4	5
	Asus X102BA	**HP Pavilion TouchSmart 15**	**Toshiba Satellite L50-B-1DV**	**Toshiba CB30-102**	**Asus X552CL**
Price	**£270 inc VAT**	**£500 inc VAT**	**£500 inc VAT**	**£250 inc VAT**	**£500 inc VAT**
Website	Asus.com/uk	Hp.com/uk	Toshiba.co.uk	Toshiba.co.uk	Asus.com/uk
Launch date	May 14	May 14	Jul 14	Jun 14	Jun 14
Build rating	★★★☆☆	★★★★☆	★★★½☆	★★★½☆	★★★★☆
Features rating	★★★½☆	★★★½☆	★★★½☆	★★★½☆	★★★★☆
Performance rating	★★☆☆☆	★★★½☆	★★★☆☆	★★★★☆	★★★½☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★½☆	★★★★☆	★★★½☆
Processor	1GHz AMD A4-1200	1.6GHz Intel Core i5-4200U	1.6GHz Intel Core i5-4200U	1.4GHz Intel Celeron 2955U	1.8GHz Intel i5-3337U
RAM	4GB DDR3L	8GB DDR3	8GB DDR3	2GB DDR3	6GB DDR3
Storage	500GB HDD	750GB HDD	1TB HDD	16GB SSD	750GB HDD
Screen size	10.1in glossy touchscreen	15.6in glossy touchscreen	15.6in glossy	13.3in glossy	15.6in glossy
Screen resolution	1366x768	1366x768	1366x768	1366x768	1366x768
Graphics	AMD Radeon HD 8180	GT 740M/Intel HD 4400	Intel HD Graphics 4400	Intel HD Graphics	nVidia GeForce GT 710M
Video memory	N/A	N/A	N/A	N/A	1GB
Wireless	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11a/g/n	802.11b/g/n
Ethernet	10/100	10/100	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	×
USB	1x USB 3.0, 2x USB 2.0	2x USB 3.0, 1x USB 2.0	2x USB 3.0, 1x USB 2.0	2x USB 3.0	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	None	8x DVD±RW	N/A	None	8x DVD±RW
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Windows 8 64-bit	Windows 8 64-bit	Windows 8.1 64bit	Google Chrome OS	Windows 8 64bit
Bundled software	MS Office Home & Student	None	None	None	None
Battery	33Wh lithium-ion	60fps (720)	52Wh lithium-ion	Lithium-polymer	37Wh lithium-ion
Battery life	4 hrs 20 mins	41Wh lithium-ion	4 hrs 15 mins	7 hrs 25 mins	3 hrs 20 mins
PC Mark 7 score	1100	5 hrs 45 mins	2500	N/A	2700
Stalker (Low/High)	N/A	2860	23fps (720p)	N/A	50fps (720p)
Dimensions	266x185x29mm	386x258x25mm	380x260x24mm	454x268x56mm	380x251x34mm
Weight	1.1kg	2.6kg	2.2kg	1.5kg	2.4kg
Warranty	1-year return-to-base	1-year return-to-base	2-year return-to-base	1-year return-to-base	1-year return-to-base
FULL REVIEW	TINYURL.COM/PLAUQCG	TINYURL.COM/L2JAXH7	TINYURL.COM/L76JXUV	TINYURL.COM/LQEBYPA	TINYURL.COM/JWFOQJL

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£501-£1,000 laptops

	1 PC ADVISOR RECOMMENDED	2	3	4	5
	Scan 3XS Graphite LG156	Dell Inspiron 17-7737	Chillblast Defiant 2 Mini	Chillblast Helium	Toshiba Portégé R30-A-14K
Price	**£899 inc VAT**	**£849 inc VAT**	**£899 inc VAT**	**£899 inc VAT**	**£910 inc VAT**
Website	3xs.scan.co.uk	Dell.co.uk	Chillblast.com	Chillblast.com	Toshiba.co.uk
Launch date	Jul 14	Jul 14	Jul 14	Jul 14	Mar 14
Build rating	★★★★☆	★★★★½	★★★★☆	★★★½☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★☆☆
Value rating	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★☆☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★½☆
Processor	2.5GHz Intel Core i7-4710MQ	2GHz Intel Core i7-4510U	2.5GHz Intel Core i7-4710MQ	1.8GHz Intel Core i7-4500U	2.4GHz Intel Core i3-4000M
RAM	8GB DDR3	16GB DDR3	8GB DDR3	16GB DDR3	4GB DDR3
Storage	1TB SSHD	500GB HDD + 8GB NAND	1TB SSHD	500GB HDD + 120GB SSD	500GB HDD
Screen size	15.6in matt	17.3in glossy	13.3in non-reflective	14in	13.3in matt
Screen resolution	1920x1080	1920x1080	1920x1080	1600x900	1366x768
Graphics	GTX 860M/Intel HD 4600	GT 750M/Intel HD 4400	GTX 860M/Intel HD 4600	Intel HD Graphics 4400	Intel HD Graphics 4600
Video memory	2GB	2GB	2GB	N/A	N/A
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n/ac
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	3x USB 3.0, 1x USB 2.0	4x USB 3.0	2x USB 3.0	2x USB 3.0	3x USB 3.0
FireWire	×	×	×	×	×
Thunderbolt	×	×	×	×	×
DisplayPort	×	×	×	×	×
HDMI	✓	✓	✓	✓	✓
DVI	×	×	×	×	×
VGA	✓	✓	✓	✓	✓
eSATA	✓ (shared USB 3.0)	×	×	×	×
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	1080p webcam	720p webcam	1080p webcam	720p webcam	2Mp webcam
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 64bit
Bundled software	None	None	None	None	None
Stalker (720p/1080p)	178/102fps	104/63fps	180/100fps	29fps (720p)	25fps (720p)
Battery	77Wh lithium-ion	58Wh lithium-ion	62.2Wh lithium-ion	44.6Wh lithium-ion	66Wh lithium-ion
Battery life	4 hours	5 hrs	5 hrs 33 mins	5 hrs 20 mins	8 hrs 4 mins
PCMark 7 score	4846	4260	4456	5100	2660
Dimensions	374x250x43mm	412x269x28mm	330x227x32mm	337x236x21mm	316x227x27mm
Weight	2.7kg	3.3kg	2.1kg	2.1kg	1.5kg
Warranty	2-year return-to-base	1-year NBD	2-year collect-and-return	1-year return-to-base	3-year return-to-base
FULL REVIEW	TINYURL.COM/MYTG9X5	TINYURL.COM/N6828JG	TINYURL.COM/NNDFZRR	TINYURL.COM/P7U28WQ	TINYURL.COM/K9Y86QS

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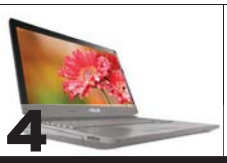
£1,001+ laptops	1	2	3	4 	5
	Gigabyte P35W v2-CF2	**Schenker XMG P304**	**Dell XPS 15**	**Asus G750JZ**	**Alienware 17**
Price	**£1,399 inc VAT**	**£1,100 inc VAT**	**£1,499 inc VAT**	**£1,770 inc VAT**	**£1,699 inc VAT**
Website	Uk.gigabyte.com	Mysn.co.uk	Dell.co.uk	Asus.com/uk	Alienware.co.uk
Launch date	Jul 14	Jul 14	Sep 14	Jul 14	Jul 14
Build rating	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★★	★★★★½
Performance rating	★★★★½	★★★★½	★★★★½	★★★★½	★★★★½
Value rating	★★★★½	★★★★☆	★★★★☆	★★★½☆	★★★★☆
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	2.5GHz Intel Core i7-4710HQ	2.2GHz Intel Core i7-4702MQ	2.2GHz Intel Core i7-4702HQ	2.4GHz Intel Core i7-4700MQ	2.4GHz Intel Core i7-4700MQ
RAM	16GB DDR3	8GB DDR3	16GB DDR3	16GB DDR3	8GB DDR3
Storage	1TB/2x 128GB SSD	250GB SSD	512GB SSD	1TB/256GB SSD	1TB + 80GB SSD
Screen size	15.6in matt	13.3in matt	15.6in gloss	17.3in matt	17.3in anti-glare
Screen resolution	1920x1080	1920x1080	3200x1800	1920x1080	1920x1080
Graphics	nVidia GeForce GTX 870M	nVidia GeForce GTX 860M	nVidia GeForce GT 750M	nVidia GeForce GTX 880M	nVidia GeForce GTX 880M
Video memory	6GB	2GB	2GB	4GB	8GB
Wireless	802.11a/b/g/n	802.11b/g/n/ac	802.11b/g/n/ac	802.11a/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	×	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0, 2x USB 2.0	3x USB 3.0, 1x USB 2.0	3x USB 3.0, 1x USB 2.0	4x USB 3.0	4x USB 3.0
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	N/A	None	N/A	N/A	None
Extras	720p webcam	720p webcam	720p webcam	720p webcam	720p webcam
Operating system	Windows 8.1 64bit	Windows 8.1 64bit	Windows 8.1 64bit	Windows 8.1 64bit	Windows 8.1 64bit
Bundled software	None	None	None	None	None
Stalker (720p/1080p)	185/122fps	115fps (1080p)	68fps (1080)	182/135fps	150fps (1080)
Battery	75.8Wh lithium-polymer	62Wh lithium-ion	91Wh lithium-ion	88Wh lithium-ion	86Wh lithium-ion
Battery life	4 hrs	5 hrs 5 mins	5 hrs	4 hrs 32 mins	4 hrs 20 mins
PCMark7 score	6226	5500	5833	5929	5600
Dimensions	385x270x21mm	374x250x37mm	372x254x18mm	410x318x58mm	414x299x48.5mm
Weight	2.5kg	2kg	2kg	4.5kg	4.2kg
Warranty	2-year return-to-base	2-year collect-and-return	1-year next day in-home	2-year return-to-base	1-year next day in-home
FULL REVIEW	TINYURL.COM/O9WUF8S	TINYURL.COM/Q4JWVSM	TINYURL.COM/N9GRT4U	TINYURL.COM/O8AGBOL	TINYURL.COM/Q6DUD64

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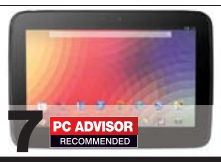
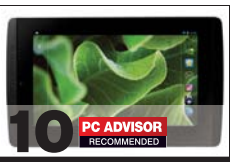
Tablets

	Google Nexus 7 (2013)	Samsung Galaxy Tab S 8.4	Apple iPad Air	Samsung Galaxy Tab S 10.5	Sony Xperia Z2 Tablet
Price	**£199 inc VAT**	**£319 inc VAT**	**£399 inc VAT**	**£399 inc VAT**	**£399 inc VAT**
Website	Play.google.com	Samsung.com/uk	Apple.com/uk	Samsung.com/uk	Sony.co.uk
Launch date	Jul 13	Aug 14	Oct 13	Aug 14	Apr 14
Overall rating	★★★★½	★★★★½	★★★★☆	★★★★½	★★★★½
Platform	Android 4.3 Jelly Bean	Android 4.4.2 KitKat	Apple iOS 7	Android 4.4.2 KitKat	Android 4.4.2 KitKat
Screen size/resolution	7in/1280x800	8.4in/2560x1600	9.7in/2048x1536	10.5in/2560x1600	10.1in/1920x1200
Storage/media card slot	16GB/none	16GB/32GB	16GB/none	16GB/32GB	16GB/none
Connectivity	802.11b/g/n, Bluetooth 4	802.11a/b/g/n/ac, Bluetooth 4	802.11a/b/g/n, Bluetooth 4	802.11b/g/n/ac, Bluetooth 4	802.11b/g/n/ac, Bluetooth 4
Processor	1.5GHz Snapdragon S4 Pro	Exynos 5	Apple A7	Exynos 5420	2.3GHz Snapdragon 801
RAM	2GB	3GB	1GB	3GB	3GB
Claimed battery life	9 hrs	12 hrs	10 hrs	Not specified	Not specified
Cameras (front/rear)	1.2/5Mp	2.1/8Mp	1.2/5Mp	2.1/8Mp	2.2/8.1Mp
Dimensions	114x200x8.7mm	126x213x6.6mm	169x240x7.5mm	247x177x6.6mm	266x172x6.4mm
Weight	299g	294g	469g	465g	439g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/QYUDY5C	TINYURL.COM/KL6G9FJ	TINYURL.COM/LSB84EE	TINYURL.COM/OESDFZQ	TINYURL.COM/M8BZZUN

Tablets





	Apple iPad mini (1st gen)	Google Nexus 10 by Samsung	Sony Xperia Tablet Z	LG G Pad 8.3	Advent Vega Tegra Note 7
Price	**£249 inc VAT**	**£319 inc VAT**	**£339 inc VAT**	**£199 inc VAT**	**£129 inc VAT**
Website	Apple.com/uk	Play.google.com	Sony.co.uk	Lg.com/uk	Currys.co.uk
Launch date	Nov 12	Nov 12	May 13	Feb 14	Nov 13
Overall rating	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★★☆
Platform	Apple iOS 7	Android 4.4 KitKat	Android 4.1 Jelly Bean	Android 4.2 Jelly Bean	Android 4.3 Jelly Bean
Screen size/resolution	7.9in/1024x768	10.1in/2560x1600	10.1in/1920x1200	8.3in/1920x1200	7in/1280x800
Storage/media card slot	16GB/none	16GB/none	16GB/microSDXC	16GB/microSDHC	16GB/microSDHC
Connectivity	802.11b/g/n, Bluetooth 4	802.11b/g/n, Bluetooth 4, NFC	802.11a/b/g/n, Bluetooth 4	802.11a/b/g/n, Bluetooth 4	802.11b/g/n, Bluetooth 4
Processor	1GHz Apple A5	1.7GHz Cortex A-15	1.5GHz SnapDragon S4 Pro	1.5GHz Snapdragon 600	1.9GHz nVidia Tegra 4
RAM	512MB	2GB	2GB	2GB	1GB
Claimed battery life	10 hrs	9 hrs	10 hrs	8.5 hrs (actual)	10 hrs
Cameras (front/rear)	1.2/5Mp	1.9/5Mp	2.2/8.1Mp	1.3/5Mp	0.3/5Mp
Dimensions	135x200x7.2mm	178x264x8.9mm	172x266x6.9mm	127x217x8.3mm	120x190x10mm
Weight	308g	603g	495g	338g	320g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/CLJWUVS	TINYURL.COM/ARL2KDG	TINYURL.COM/ODTP6B8	TINYURL.COM/N8OBC7N	TINYURL.COM/PMCO4H4

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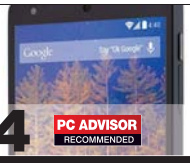
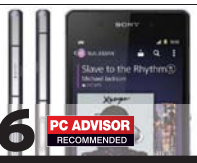
Smartphones

	1	2	3	4	5
					
	PC ADVISOR GOLD	PC ADVISOR GOLD	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR GOLD
	LG G3	**LG G2**	**HTC One (M8)**	**Google Nexus 5**	**OnePlus One**
Price	**£499 inc VAT**	**£279 inc VAT**	**£550 inc VAT**	**£299 inc VAT**	**£229 inc VAT**
Website	Lg.com/uk	Lg.com/uk	Htc.com/uk	Play.google.com	Oneplus.net/uk
Launch date	Jun 14	Sep 13	Apr 14	Oct 13	Jul 14
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★★½
Platform	Android 4.4.2 KitKat	Android 4.2 Jelly Bean	Android 4.4 KitKat	Android 4.4 KitKat	CyanogenMod 11S
Processor	2.5GHz Snapdragon 801	2.26GHz Snapdragon 800	2.3GHz Snapdragon 801	2.3GHz Snapdragon 800	2.5GHz Qualcomm
Storage/media card slot	16GB/none	16GB/none	16GB/microSD	16GB/none	16GB/none
Screen size/resolution	5.2in/1440x2560	5.2in/1920x1080	5in/1920x1080	4.95in/1920x1080	5.5in/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	Not specified
Cameras (front/rear)	13Mp, 1080p video	13Mp, 1080p video	5Mp, 1080p video	8Mp, 1080p video	13Mp, 720p video
GPS	A-GPS	A-GPS	A-GPS, Glonass	A-GPS	Glonass
Dimensions, weight	75x146x8.9mm, 149g	71x139x9.4mm, 143g	146.4x70.6x9.4mm, 160g	69x138x8.9mm, 130g	152.9x75.9x8.9mm, 162g
Warranty	1 year	1 year	2 years	1 year	Not specified
FULL REVIEW	TINYURL.COM/MQ8DHUU	TINYURL.COM/PAFK4SZ	TINYURL.COM/NGBWXY9	TINYURL.COM/PAFK4SZ	TINYURL.COM/KYW977U

Smartphones

	6	7	8	9	10
					
	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	Sony Xperia Z2	**Sony Xperia Z1 Compact**	**Apple iPhone 6**	**Apple iPhone 6 Plus**	**HTC One mini 2**
Price	**£599 inc VAT**	**£401 inc VAT**	**£539 inc VAT**	**£619 inc VAT**	**£359 inc VAT**
Website	Sonymobile.com	Sonymobile.com	Apple.com/uk	Apple.com/uk	Htc.com/uk
Launch date	May 14	Jan 14	Sep 14	Sep 14	Jul 14
Overall rating	★★★★½	★★★★½	★★★★½	★★★★½	★★★★☆
Platform	Android 4.4 KitKat	Android 4.3 Jelly Bean	iOS 8	iOS 8	Android 4.4 KitKat
Processor	2.3GHz Qualcomm	2.2GHz Snapdragon 800	1.2GHz Apple A8	1.2GHz Apple A8	1.2GHz Qualcomm
Storage/media card slot	16GB/microSDXC	16GB/microSDXC	16GB/none	16GB/none	16GB/microSD
Screen size/resolution	5.2in/1920x1080	4.3in/1280x720	4.7in/1334x750	5.5in/1920x1080	4.5in/1280x720
Screen type	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch
Connectivity	4G, NFC, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi
Claimed battery life	17 hrs/740 hrs	18 hrs/670 hrs	14 hrs/250 hrs	24 hrs/384 hrs	Not specified
Cameras (front/rear)	20.7Mp, 1080p video	20.7Mp, 1080p video	8Mp, 1080p video	8Mp, 1080p video	13Mp, 1080p video
GPS	A-GPS	A-GPS	A-GPS	A-GPS	A-GPS
Dimensions, weight	146.8x73.3x8.2mm, 163g	127x64.9x9.5mm, 137g	138.1x67x6.9mm, 129g	158.1x77.8x7.1mm, 172g	137x65x10.6mm, 137g
Warranty	1 year	1 year	1 year	1 year	2 years
FULL REVIEW	TINYURL.COM/NXB5SWV	TINYURL.COM/KAU7DYR	TINYURL.COM/K2ELJ77	TINYURL.COM/KF9VU5C	TINYURL.COM/M6U427B

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Gaming PCs	1 PC ADVISOR GOLD	2	3	4 PC ADVISOR RECOMMENDED	5
	Chillblast Fusion Probe	Chillblast Fusion Ranger	Gladiator Firestorm OC	CyberPower Infinity Perseus XT	Computer Planet GX 760
Price	**£1,299 inc VAT**	**£1,249 inc VAT**	**£695 inc VAT**	**£1,499 inc VAT**	**£983 inc VAT**
Website	Chillblast.com	Chillblast.com	Gladiatorpc.co.uk	Cyberpowersystem.co.uk	Computerplanet.co.uk
Launch date	Feb 14	Jul 14	Mar 14	Feb 14	Mar 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★½
Features rating	★★★★½	★★★★☆	★★★½☆	★★★★★	★★★½☆
Performance rating	★★★★½	★★★★½	★★★★☆	★★★★½	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★½	★★★½☆	★★★½☆
Overall rating	★★★★½	★★★★☆	★★★★½	★★★★½	★★★★☆
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 4.2GHz)	3.4GHz Intel Core i5-4670K (OC 4.4GHz)	3.4GHz Intel Core i5-4670K
CPU cooler	Corsair H55 Liquid Cooler	Corsair H60 Liquid Cooler	Be Quiet Dark Rock 3	Cooler Master Seldon 120mm	Corsair H60 Hydro
Memory	16GB DDR3	16GB DDR3	8GB DDR3	16GB DDR3	8GB DDR3
Storage	120GB SSD + 2TB HDD	120GB SSD + 2TB HDD	2TB HDD	256GB SSD + 2TB HDD	120GB SSD + 2TB HDD
Power supply	750W Corsair	750W Corsair	500W Corsair	750W Corsair	450W Corsair
Motherboard	Gigabyte GA-Z87N-Wi-Fi	Asus Maximus VII Ranger	MSI Z87M Gaming	Gigabyte GA-Z87-HD3	Gigabyte GA-Z87N-Wi-Fi
Operating system	Windows 8.1 64-bit	Windows 8.1 64bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Screen	23.6in Iiyama X2377HDS	None supplied	None supplied	23in AOC i2367fh	None supplied
Graphics	Palit Jetstream GeForce GTX 780, 3GB VRAM	PowerColor AMD Radeon R9 290 OC, 4GB VRAM	MSI nVidia GeForce GTX 750 Ti Gaming, 2GB VRAM	Powercolor AMD R9 290, 4GB VRAM	Zotac GeForce GTX 760, 2GB VRAM
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Connectivity	Gigabit ethernet, 802.11n	Gigabit ethernet	Low-lag ethernet	Gigabit ethernet	2x gigabit ethernet, 802.11n
Ports	6x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0, 2x DVI, HDMI, DP	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
Optical drive	DVD±RW (Blu-ray optional)	24x DVD±RW	24x DVD±RW	DVD±RW, BD-ROM	None supplied
Case	Aerocool Dead Silence Gaming Cube	Corsair Graphite 230T	Aerocool Dead Silence Cube Window Red	Cooler Master Dominator 690 III	Fractal Design Node 304
Keyboard & mouse	Gigabyte M6800 mouse, Force K3 keyboard	None	None	Gigabyte M6900 mouse, Force K3 keyboard	None
Other	Optional family pack	None	None	None	None
PC Mark 7 score	6965	6852	5124	6731	5508
Alien vs Predator score (720p/1080p)	169/93fps	173/97	103/54fps	172/96fps	103/54fps
Final Fantasy XIV (720p/1080p)	218/96fps	N/A	N/A	167/87fps	N/A
Sniper Elite V2 (Low/High/Ultra)	308/187/49fps	321/164/42	194/81.6/18.6fps	352/155/39fps	261/119/29fps
Power Consumption	52/407W	67W/386W	70W/166W	68/484W	53W/271W
Warranty	2-year collect-and-return	2-year collect-and-return	4-year return-to-base	3-year RTB (2 years parts, 3 years labour)	3-year return-to-base
FULL REVIEW	TINYURL.COM/OWQ24QQ	TINYURL.COM/MEGK9O9	TINYURL.COM/PKDV2NG	TINYURL.COM/NKWN7V4	TINYURL.COM/MJZKS7G

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Mini PCs

	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	★★★½☆	★★★☆☆	★★★★☆	★★★½☆	★★★½☆
Features rating	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★½☆	★★★★★	★★★★☆	★★★★☆
Value rating	★★★½☆	★★★★☆	★★★☆☆	★★★½☆	★★★☆☆
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 Z871-Pro	Asus H811-PLUS	MSI Z871 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/MQ8POPQ	TINYURL.COM/NFQ6EGO	TINYURL.COM/PWCACV2	TINYURL.COM/MXMJ6QT	TINYURL.COM/O4QDH7Y

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All-in-one PCs

	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	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**	**£1,199 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	★★★★½	★★★★★	★★★★☆	★★★½☆	★★★★☆
Features rating	★★★★½	★★★★½	★★★½☆	★★★★☆	★★★★☆
Performance rating	★★★★½	★★★★☆	★★½☆☆	★★★½☆	★★½☆☆
Value rating	★★★½☆	★★★★☆	★★★★★	★★★½☆	★★★½☆
Overall rating	★★★★½	★★★★½	★★★★☆	★★★½☆	★★★½☆
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

	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	★★★★½	★★★★☆	★★★½☆	★★★★☆	★★★☆☆
Features rating	★★★½☆	★★★½☆	★★★★½	★★★½☆	★★★½☆
Performance rating	★★★½☆	★★★★☆	★★★★½	★★★½☆	★★½☆☆
Value rating	★★★★☆	★★★½☆	★★★☆☆	★★★½☆	★★★½☆
Overall rating	★★★★☆	★★★½☆	★★★½☆	★★★½☆	★★★½☆
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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- Microsoft Windows 7 Home Premium

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- 500GB Solid State Drive
- 2000GB Hard Disk
- Blu-Ray ROM / DVD-RW Combi Drive
- Microsoft Windows 7 Home Premium

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Family PCs

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	Chillblast Fusion Commando	Wired2Fire Diablo Reactor	Mesh Elite 4670-PCA	Dino PC Raging Lizard V2	Arbico Family i3 4185
Price	**£799 inc VAT**	**£668 inc VAT**	**£799 inc VAT**	**£780 inc VAT**	**£675 inc VAT**
Website	Chillblast.com	Wired2fire.co.uk	Meshcomputers.com	Dinopc.com	Arbico.co.uk
Launch date	Jul 13	May 14	May 14	May 14	May 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★☆☆
Features rating	★★★★☆	★★★½☆	★★★★½	★★★½☆	★★★☆☆
Performance rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★☆☆
Value rating	★★★★☆	★★★★½	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★★☆
Processor	3.2GHz Intel Core i5-4570	3.4GHz Intel Core i5-4670	3.4GHz Intel Core i5-4670	3.5GHz Intel Core i5-4690	3.4GHz Intel Core i3-4130
RAM	16GB DDR3	8GB DDR3 1600MHz	16GB DDR3 1600MHz	8GB DDR3 1600MHz	8GB DDR3 1600MHz
Storage	1TB HDD + 120GB SSD	1TB HDD	2TB HDD + 120GB SSD	1TB HDD + 128GB SSD	1TB HDD + 120GB SSD
Motherboard	Asus B85M-G	Asus B85M-G	MSI B85M-E45	Gigabyte H97M-D3H	MSI B85M-E45
CPU cooler	Arctic Cooling Freezer 7 Pro	Standard Intel Cooler	Standard Intel Cooler	Standard Intel Cooler	Arctic Cooling Freezer 7 Pro
Power supply	600W CiT	500W FSP	500W FSP	500W CIT	650W Arctic Red
Screen	23in Iiyama X2377	24in AOC E2495Sh	24in Iiyama E2483HS-B1	24in Iiyama E2483HS-B1	23.6in AOC E2470SWHE
Screen resolution	1920x1080	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Graphics	Zotac nVidia GeForce GTX 650 Ti	AMD Radeon R7 265	nVidia GeForce GTX 750 Ti	nVidia GeForce GTX 750 Ti	MSI AMD Radeon R7 250
Video memory	N/A	2GB	2GB	2GB	2GB
Connectivity	802.11b/g/n, gigabit ethernet	Gigabit ethernet	Gigabit ethernet	Gigabit ethernet, 802.11b/g/n	Gigabit ethernet
USB	3x USB 3.0, 6x USB 2.0	3x USB 3.0, 6x USB 2.0, 2x HDMI, VGA	4x USB 3.0, 8x USB 2.0, HDMI, VGA, DVI-D, DVI, DP	5x USB 3.0, 3x USB 2.0, 2x HDMI (1x e-Mini), VGA, 2x DVI	2x USB 3.0, 6x USB 2.0, HDMI, VGA, DVI-D
Media card slot	None	None	None	None	None
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	2x Logitech LS220	None	None	None	None
Case	Cooler Master Force 500	Zalman Z3 Plus	Zalman Z3 Plus	Fractal Design Core 1000 USB3	CIT Templar
Keyboard	Logitech MK260	Octigen Wireless combo	Logitech MK270 (wireless combo)	Gigabyte KM6150 (wired combo)	Logitech MK120
Optical drive	LG BD-ROM/DVD±RW	LiteOn DVD RW	24x DVD RW	None	Samsung DVD RW
Operating system	Windows 8 64-bit	Windows 8.1 64bit	Windows 8.1 64bit	Windows 8.1 64bit	Windows 8.1 64bit
Bundled software	None	None	None	None	Ahead Nero, CyberLink PowerDVD
Sniper V2 Elite score (Low/High/Ultra)	147/59/14fps	240/76/18fps	195/68/16fps	196/83/20fps	62/22/5fps
Alien vs Predator score (720p/1080p)	52/27fps	83/44fps	71/37fps	102/53fps	22/11fps
PCMark 7 score	6177	3938	7304	6431	4800
Warranty	2-year collect-and-return	2-year return-to-base	3-years labour (2-year parts, 3-months free C&R)	3-year labour (2-year parts)	2-year return-to-base
FULL REVIEW	TINYURL.COM/KF6G3T7	TINYURL.COM/OA8UKDP	TINYURL.COM/OZCSHYU	TINYURL.COM/PFA55F7	TINYURL.COM/NU7FSGB

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Sub-£150 printers

	1	2	3	4	5
		PC ADVISOR RECOMMENDED			
	Samsung Xpress M2070W	**Canon Pixma MG5550**	**Samsung Xpress M2022W**	**Canon Pixma MX535**	**Brother MFC-J870DW**
Price	**£99 inc VAT**	**£65 inc VAT**	**£59 inc VAT**	**£70 inc VAT**	**£137 inc VAT**
Website	Samsung.com/uk	Canon.co.uk	Samsung.com/uk	Canon.co.uk	Brother.co.uk
Launch date	Mar 14	Apr 14	Aug 14	Jul 14	Jul 14
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Technology	Mono laser	Colour inkjet	Mono laser	Colour inkjet	Colour inkjet
Max print resolution	1200x1200	4800x1200dpi	1200x1200dpi	4800x1200dpi	6000x1200dpi
Actual print speed	B=17.1ppm	B=11.8ppm C=8.7ppm	B=18ppm	B=9.7ppm C=3.8ppm	B=18ppm C=11ppm
Scan/fax facilities	1200x1200 scans	1200x2400 scans	None	1200x2400 scans/fax	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	USB 2.0, 802.11b/g/n, AirPrint	USB 2.0, 802.11b/g/n, NFC
Cost per page	B=3.8p	B=2.4p C=4.8p	B=5p	B=2.7p C=4.8p	B=3.9p C=2.5p
Media card/auto duplex	××	×✓	××	×✓	✓✓
Input capacity	150 sheets	100 sheets	150 sheets	100 sheets + 30-sheet ADF	150 sheets + 20 ADF
Dimensions	406x360x253mm	455x369x148mm	332x215x178mm	458x385x200mm	410x374x180mm
Weight	7.4kg	6.3kg	4kg	8.5kg	9.5kg
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/OYZKJKE	TINYURL.COM/LKWLJDE	TINYURL.COM/NFJHDOR	TINYURL.COM/N9LXVN7	TINYURL.COM/M52V29R

£151+ printers

	1	2	3	4	5
			PC ADVISOR GOLD		
	Canon i-Sensys MF6180dw	**Brother HL-L9200CDWT**	**HP OfficeJet Pro X551dw**	**Kyocera Ecosys P6030cdn**	**Lexmark CS410dn**
Price	**£305 inc VAT**	**£575 inc VAT**	**£410 inc VAT**	**£546 inc VAT**	**£195 inc VAT**
Website	Canon.co.uk	Brother.co.uk	Hp.com/uk	Kyoceradocumentsolutions.co.uk	Lexmark.co.uk
Launch date	May 14	Aug 14	Aug 13	Jul 14	Jul 14
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★★☆
Technology	Mono laser	Colour laser	Colour inkjet	Colour laser	Colour laser
Max print resolution	1200x600dpi	2400x600dpi	2400x2400	9600x600dpi	1200x1200dpi
Actual print speed	B=24ppm	B=30ppm C=30ppm	B=42.9ppm C=15.8ppm	B=27ppm C=27ppm	B=23.1ppm C=13.6ppm
Scan/fax facilities	600dpi scanner, 33.6Kbps fax	None	None	None	None
Supported interfaces	USB 2.0, ethernet, 802.11b/g/n	USB 2.0, ethernet, 802.11b/g/n	USB 2.0, ethernet, 802.11b/g/n	USB 2.0	USB 2.0, ethernet
Cost per page	B=1.5p	B=1p C=5.9p	B=1p C=4.3p	B=1.2p C=1.7p	B=1.8p C=9.5p
Media card/auto duplex	×✓	×✓	×✓	×✓	×✓
Input capacity	250 + 50 sheet + 50 ADF	750 sheets + 50 sheet	500 + 50 sheet	500 sheets + 150 (2150 max)	250 + 1 sheets
Dimensions	390x473x431mm	410x495x445mm	517x399x414mm	345x518x480mm	291x442x407mm
Weight	19.1kg	28.3kg	17.1kg	29.5kg	20.5kg
Warranty	1 year	1 year	1 year	2 years	1 year
FULL REVIEW	TINYURL.COM/LE9WA5N	TINYURL.COM/PT52MH6	TINYURL.COM/CZO5P65	TINYURL.COM/N4MCYLF	TINYURL.COM/MJG33UL

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Blu-ray drives

	1	2	3 PC ADVISOR RECOMMENDED	4	5
	Pioneer BDR-209EBK Retail	**Pioneer BDR-209DBK OEM**	**LG LN48919**	**LG BP40NS20**	**Lite-On IHES112-115**
Price	**£59 inc VAT**	**£54 inc VAT**	**£60 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	★★★★½	★★★★½	★★★★½	★★★★☆	★★★½☆
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 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5 PC ADVISOR RECOMMENDED
	Apple AirPort Extreme	**Netgear Nighthawk R7000**	**D-Link DIR 880L**	**TP-Link Archer C7**	**Asus RT-AC68U AC1900**
Price	**£169 inc VAT**	**£240 inc VAT**	**£173 inc VAT**	**£80 inc VAT**	**£140 inc VAT**
Website	Apple.com/uk	Netgear.co.uk	Dlink.com	Tp-link.com	Uk.asus.com
Launch date	Jan 14	Sep 14	Sep 14	Jan 14	Jan 14
Overall rating	★★★★☆	★★★★½	★★★★☆	★★★★☆	★★★★☆
Standards supported	802.11a/b/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/ac
Frequency modes	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)
Antennas	6x internal	3x external	3x external	3x external, 3x internal	3x external, 3x internal
Built-in modem	×	×	×	×	×
Manufacturer's rating	1300/450Mb/s	1300/600Mb/s	1300/600Mb/s	1300/450Mb/s	1300/600Mb/s
WPS	×	✓	✓	✓	✓
Ports	Gigabit WAN, 3x gigabit LAN, USB	Gigabit WAN, 1x USB 3.0, 1x USB 2.0	Gigabit WAN, 1x USB 3.0, 1x USB 2.0	Gigabit WAN, 4x gigabit LAN, 2x USB 2.0	Gigabit WAN, 4x gigabit LAN, 2x USB 2.0
Average power use	8W	9W	10W	N/A	N/A
Max speed (11n/11ac)	171/572Mb/s	171/592Mb/s	171/625Mb/s	110/505Mb/s	98/610Mb/s
Dimensions, weight	98x168x98mm, 945g	285x186x45mm, 750g	247x190x47mm, 745g	32.5x243x160mm, 508g	160x83x220mm, 640g
Warranty	1 year	N/S	N/S	3 years	2 years
FULL REVIEW	TINYURL.COM/MFDLLSC	TINYURL.COM/Q2NR8Q	TINYURL.COM/OZ5G7KG	TINYURL.COM/KKJMPCE	TINYURL.COM/K4ZATKV

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NAS drives

	Synology DS413j	Qnap TS-421	Synology DS1813+	Asustor AS-604T	WD My Cloud EX2
Price	**£245 inc VAT (diskless)**	**£382 inc VAT (diskless)**	**£770 inc VAT (diskless)**	**£435 inc VAT (diskless)**	**£468 inc VAT**
Website	Synology.com	Qnap.com	Synology.com	Asustor.com	Wdc.com
Launch date	Oct 13	Mar 14	Jan 14	May 14	Jul 14
Overall rating	★★★★☆	★★★★☆	★★★★½	★★★★☆	★★★★☆
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	1.2GHz Processor
Memory	512MB DDR3	1GB DDR3	2GB DDR3	1GB DDR3	512MB DDR3
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 3.0
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	Downloadable My Cloud
Dimensions	184x168x230mm	177x180x235mm	175x340x233mm	230x170x185mm	99x155x171mm
Weight	2kg	3kg	5.2kg	3.5kg	2.3kg
Warranty	2 years	2 years	3 years	2 years	2 years
FULL REVIEW	TINYURL.COM/PL8XM8S	TINYURL.COM/MCYWUB8	TINYURL.COM/PWO4M6J	TINYURL.COM/NX5QO8M	TINYURL.COM/LTCNFEX

USB drives

	G-Technology Professional	WD My Passport Pro 4TB	LaCie Little Big Disk	G-Technology Thunderbolt	Toshiba Stor.E Basics
Price	**£250 inc VAT**	**£350 inc VAT**	**£770 inc VAT**	**£599 inc VAT**	**£80 inc VAT**
Website	G-technology.com	Wdc.com/en	Lacie.com/uk	G-technology.com	Toshiba.co.uk
Launch date	Sep 13	Aug 14	Feb 14	Aug 12	Nov 13
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★½	★★★★☆
Capacity tested	4TB	4- to 8TB	1TB	8TB	2TB
Capacity range	2TB to 4TB	2- to 4TB	512GB to 2TB	4TB to 8TB	320GB to 2TB
Disk size	3.5in	2.5in	2.5in	3.5in	2.5in
Spin speed	7200rpm	7200rpm	5400rpm	7200rpm	5400rpm
Transfer speed	N/A	230MB/s	635MB/s	329MB/s	94MB/s (USB 3.0)
Encryption	None	None	None	None	None
Other interfaces	FireWire 800	None	None	None	None
Software	None	None	LaCie Backup Assistant	None	None
Dimensions	235x130x46mm	88x143x44mm	40x140x85mm	235x130x85mm	119x79x21mm
Weight	1.35kg	700g	650g	2.3kg	215g
Warranty	3 years	3 years	1 year	3 years	1 year
FULL REVIEW	TINYURL.COM/NV7F32F	TINYURL.COM/QAGQEUG	TINYURL.COM//KRCL3VZ	TINYURL.COM/CXEF6MH	TINYURL.COM/LBHC8EL

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SSDs

	Crucial M550	OCZ Vector 150	Crucial M500	Samsung 840 EVO	Seagate 600 SSD
Price	**£344 inc VAT**	**£131 inc VAT**	**£169 inc VAT**	**£359 inc VAT**	**£202 inc VAT**
Website	Crucial.com/uk	Ocz.com	Crucial.com/uk	Samsung.com/uk	Seagate.com/gb
Launch date	May 14	May 14	Aug 13	Nov 13	May 14
Overall rating	★★★★½	★★★★☆	★★★★½	★★★★½	★★★★☆
Capacity tested	1TB	240GB	480GB	750GB	480GB
Price per GB	34p	55p	35p	48p	43p
Memory cache	1GB LP DDR2	512MB	512MB DDR3	1GB LPDDR2	N/A
Controller	Marvell 88SS9189	Indilinx Barefoot 3 M00	Marvell 88SS9187	Samsung MEX (3-core ARM)	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	Micron 20nm MLC NAND	Samsung 19nm Toggle NAND	Toshiba 19nm MLC
Firmware updated via	Bootable CD	OCZ Toolbox, bootable	ISO boot disc	SSD Magician for Windows	Seagate Firmware, bootable
ATTO peak sequential	R: 563MB/s; W: 514MB/s	R: 557MB/s; W: 534MB/s	R: 539MB/s; W: 433MB/s	R: 554MB/s; W: 537MB/s	R: 555MB/s; W: 474MB/s
CDM peak IOPS	100 / 91.7	92.9 / 94.7	89.8k (read)	104K (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	3 years	5 years	3 years
FULL REVIEW	TINYURL.COM/MSWD98Z	TINYURL.COM/KBED2W6	TINYURL.COM/M2NCSMJ	TINYURL.COM/L5EDQOY	TINYURL.COM/N58RB8G

Projectors

	BenQ W1300	Optoma W316	NEC M352WS	Optoma ML1500	Optoma EW400
Price	**£767 inc VAT**	**£463 inc VAT**	**£780 inc VAT**	**£657 inc VAT**	**£681 inc VAT**
Website	Benq.co.uk	Optoma.co.uk	Nec-display-solutions.com	Optoma.co.uk	Optoma.co.uk
Launch date	Jun 14	Jul 14	Jul 14	Jul 14	Sep 14
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Projection technology	DLP	DLP	DLP	DLP	DLP
Resolution (pixels)	1920x1080	1280x800	1280x800	1280x800	1280x800
Brightness, Contrast	2000, 10,000:1	3400, 15,000:1	3500, 10,000:1	1500, 15000:1	1500, 15000:1
Image size	300in	300in	150in	100in	362in
Supported aspect ratios	16:9 native	16:10, 16:9, 4:3	16:10	16:10, 16:9, 4:3	16:10, 16:9, 4:3
Noise levels (dB)	33 (30 eco)	29db	33 (39 bright mode)	30db	29db
Connections	VGA, 2x HDMI, USB, 3D	VGA, HDMI, Mini-USB, 3D	2x VGA, 2x HDMI, USB	HDMI, 2x USB-A, SD	HDMI, 1x USB-A, 1x USB-B,
Lamp/lamp life	240W/6000 hrs	190W/10000 hrs	278W/8000 hrs	LED/20,000 hrs	299W/6000 hrs
Dimensions	330x257x128mm	315x223x102mm	368x268x97mm	270x170x48mm	288x220x86mm
Weight	3.4kg	2.5kg	3.6kg	1.4kg	2.04kg
Warranty	3 years	2 years	3 years	2 years	3 years
FULL REVIEW	TINYURL.COM/K4FA89Q	TINYURL.COM/OCWTHGW	TINYURL.COM/Q6J2N6W	TINYURL.COM/QBFRYR7	TINYURL.COM/Q6EKFFA

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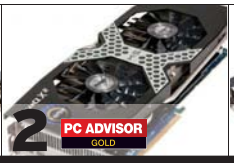
Sub-£150 graphics cards

	MSI Radeon R9 270	MSI HD 7770	MSI R7 260X OC	XFX Radeon R7 265	Gigabyte GTX 750 Ti WindForce
Price	**£130 inc VAT**	**£66 inc VAT**	**£90 inc VAT**	**£116 inc VAT**	**£115 inc VAT**
Website	Uk.msi.com	Uk.msi.com	Uk.msi.com	Xfxforce.com	Uk.gigabyte.com
Launch date	Jul 14	Sep 12	May 14	Jul 14	May 14
Overall rating	★★★★½	★★★★☆	★★★½☆	★★★★☆	★★★½☆
Graphics processor	AMD Radeon R9 270	AMD Radeon HD 7770	AMD Radeon R7 260X	AMD Radeon R7 265	nVidia GeForce GTX 750 Ti
Installed RAM	2GB GDDR5	1GB GDDR5	2GB GDDR5	2GB GDDR5	2GB GDDR5
Memory interface	256-bit	128-bit	128-bit	256-bit	128-bit
Core clock/Boost	900MHz/975MHz	1GHz/none	1175MHz/none	900MHz/925MHz	1033MHz/1111MHz
Memory clock/Effective	1.4GHz/5.6GHz	1125MHz/4.5GHz	1625MHz/6.5GHz	1.4GHz/5.6GHz	1.35GHz/5.4GHz
Stream processors	1280	640	896	Varies	640
Texture units	80	40	56	64	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, 1x HDMI, 1x DP	2x DVI, 2x HDMI
Warranty	3 years	3 years	3 years	2 years	3 years
FULL REVIEW	TINYURL.COM/MCE7353	TINYURL.COM/BWJ7BL9	TINYURL.COM/OZ6WUYT	TINYURL.COM/LV69BEM	TINYURL.COM/Q7K4ESV

£151+ graphics cards



	Gigabyte GeForce GTX 770 2GB	Sapphire Radeon R9 280X	XFX Radeon R9 290X	MSI Radeon R9 270X	MSI Radeon R9 295 X2
Price	**£240 inc VAT**	**£240 inc VAT**	**£380 inc VAT**	**£155 inc VAT**	**£1,050 inc VAT**
Website	Uk.gigabyte.com	Sapphiretech.com	Xfxforce.com	Uk.msi.com	Uk.msi.com
Launch date	Aug 13	Mar 14	Apr 14	Dec 13	May 14
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★★☆
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	950MHz/1070MHz	1GHz/1GHz	1030MHz/1120MHz	1018MHz/N/A
Memory clock/Effective	1752MHz/7010MHz	1.55GHz/6.2GHz	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	2 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	5
	AOC i2369Vm	**BenQ GW2760HS**	**Philips 234E5QHAW**	**NEC MultiSync E243WMi**	**BenQ EW2740L**
Price	**£130 inc VAT**	**£170 inc VAT**	**£130 inc VAT**	**£185 inc VAT**	**£178 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	Aug 14
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Screen size	23in	27in	23in	23.8in	27in
Panel type	IPS matt	A-MCA	IPS matt	IPS matt	VA semi-matt
Native resolution	1920x1080 pixels	1920x1080 (82ppi)	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel density	96ppi	82ppi	96ppi	93ppi	82ppi
Brightness	220cd/m²	300cd/m²	187cd/m²	250cd/m²	300cd/m²
Static contrast ratio	630:1	950:1	210:1	650:1	280:1
Response time	6ms	4ms	5ms	6ms	4ms
Ports	HDMI, HDMI/MHL, DP, VGA	HDMI, DVI, VGA	2x HDMI (QHAB) or 1x HDMI (QDAB), VGA	DP, DVI-D, VGA	2x HDMI, VGA
Dimensions	531x204x398mm	472x191x623mm	532x213x414mm	558x214x380-490mm	623x191x451mm
Weight	3.75kg	4.5kg	3.5kg	6.3kg	4.2kg
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/OO6EC5L

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Price	**£218 inc VAT**	**£663 inc VAT**	**£300 inc VAT**	**£1,575 inc VAT**	**£540 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	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★½☆
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/m²	350cd/m²	240cd/m²	350cd/m²	350cd/m²
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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MATT EGAN

Mobile email is great. Isn't it?

I recently gifted an iPad to an older family member. She's tech-savvy and committed to lifelong learning, so there was never any suggestion of her struggling to get to grips with the iPad, which is, after all, a computer with stabilisers on. But witnessing her getting to grips with mobile computing has been interesting chiefly because of the differences in attitude toward privacy and communications between me at 36 and someone a generation older.

Incidentally, the attitudinal gap gets bigger when I look down from my middle age to my teenaged and younger nieces and nephews, but I'll leave that to someone else to write the blog about how out of touch I have become.

Let's take email as an interesting example of generational differences in attitudes to privacy.

My relative has been around computers from before I was born, and will definitely have used email regularly long before I ever did. But email was never an important work tool during her professional career. Indeed, it remains for her as the name suggests 'electronic mail' – a messaging system to be checked daily but more formal than a phone call, and less frequent and time-sensitive than an SMS.

I remember my own father, in the latter years of his very successful executive career, being given a laptop so he could have something to check his email from. And then him doing so *only* from that laptop, and only at specific times of the day. In retirement he shares my mum's account, and relies on her to open or even print out relevant messages. The world has changed a lot in a very short time. So much so that I can for the first time sort of understand what the Amstrad E-m@iler was all about. Sort of.

Setting up email on the iPad was a cinch. My relative already uses webmail, so it was simply a question of putting in the password and address and letting the server-side stuff resolve itself. She was impressed, but also disturbed by the simplicity of the process – even more so when at the end of our session I had to explain that there's no good reason to sign out of email on a portable device, and that even though the iPad was synching with her email account, she could simultaneously use webmail via her laptop.

In part this reflected the rational privacy concerns of someone regularly subjected to scare stories about data loss. And we could assuage that by putting a password on the iPad. But the problem was also something more subtle and significant.

The transition to mobile and ubiquitous availability makes email – and indeed social media and IM – more powerful and potentially more useful. But it also makes such communication more intrusive. Less easy to escape.

To go back to snail mail, I'm sure we'd all prefer our letters to arrive first thing in the morning, and for a reliable second post to appear every day. But I'm not sure how keen we'd all be on receiving post at every hour, day or night. Especially not if it arrived in our pockets wherever we were in the world. And that is precisely what email on a mobile device represents.

We've all got used to the idea that always on and always connected is a good thing. But I have written before about the need to stay sane and productive in such a world. And perhaps that means that going mobile with email, Facebook and all the rest is not always a great idea.

> **"Ubiquitous availability makes email more powerful and potentially more useful, but also more intrusive and less easy to escape"**

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