

TECH ADVICE YOU CAN TRUST

PC

& TECH AUTHORITY



ULTRAZOOM COMPACTS



10 SUPER
SNAPPERS
COMPARED

APPLE Vs WINDOWS

HEAD
TO
HEAD

WHICH OS
IS FASTEST?



HOW TO BUILD FIX CREATE

GET THE MOST FROM YOUR TECH!

**20
GREAT
PROJECTS**
FOR NOVICES
& EXPERTS

- MAKE A NAS BOX
- BOOST THE QUALITY OF YOUR MUSIC
- DESIGN YOUR OWN RINGTONE
- SET UP AN ONLINE FITNESS REGIME
- CLEAN YOUR KEYBOARD
- CREATE YOUR OWN PHOTO BOOK
- IMPROVE YOUR NIGHT PHOTOGRAPHY
- LABEL PLUGS
- TEACH YOURSELF 3D MODELLING
- MAKE A RASPBERRY PI MOTION-SENSING CAMERA
- CREATE STOP-MOTION ANIMATION
- EXTEND YOUR WIRELESS NETWORK
- MAKE YOUR PHONE CONTEXT-AWARE WITH NFC
- BECOME A VENTURE CAPITALIST
- MAKE AND SHARE VIDEO
- ENCRYPT YOUR DATA
- INCREASE ONLINE PRIVACY
- REFRESH AN OLD TABLET
- RIP OUT HOME CABLES
- CREATE ANIMATED GIFS
- MAKE YOUR OWN TOUCHSCREEN GLOVES

CONVERT ALL YOUR
MEDIA TO PLAY
ON ANY DEVICE



WHY WE LOVE THE NEW MICROSOFT SURFACE TABLETS

BOTH NEW
MODELS
TESTED



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- Our tests are performed by experienced reviewers in our Labs under the supervision of Editor John Gillooly
- Our brand new benchmarks have been tailor-made to reflect real-world computing needs
- We put tech through its paces – seriously. From processing power to battery life, from usability to screen brightness, our tests are exhaustive
- We will always offer an honest and unbiased opinion for every review



WHITE IS THE NEW BLACK

Dig deep into the collection of computing clichés and you'll find 'no longer beige boxes' sitting right alongside 'gaming is no longer about teenagers in darkened bedrooms'. It has been a long, long time since PCs were universally drab, and it is always fascinating to watch colours ripple through the industry. Brushed Aluminium, for example, was once the pinnacle of stylish computing, yet it is now barely seen outside of Apple stores. In recent years it seems every device has gotten blacker; a year ago white was rarely used, but now it seems to be everywhere.

Recently we have seen white cases, white headphones, white handhelds, white NAS boxes and more. Apart from the occasional splash of orange, it seems that the trend towards garish colouring that is huge in some parts of the world just doesn't work here. For tech lovers, at least, it looks like this year we will indeed have a white Christmas.

Speaking of which, this month we have a range of features designed to spark the imagination during that end of year lull time, when one finally gets around to doing what work has gotten in the way of. From our 20 tech projects to our guide to making the most of your media when on the go, there's plenty over the following pages to make the most of the silly season.

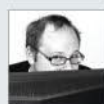
John Gillooly
[E jgillooly@haymarketmedia.com.au](mailto:jgillooly@haymarketmedia.com.au)

THE TEAM...



Managing Editor
David Hollingworth
[E dhollingworth@haymarketmedia.com.au](mailto:dhollingworth@haymarketmedia.com.au)
[T @atomicmpc](https://twitter.com/atomicmpc)

I've spent the month making John suffer after his scandalous allegations that I was eagerly anticipating Ryse. He's sorry.



Video Producer
Josh Lundberg
[E jlundberg@haymarketmedia.com.au](mailto:jlundberg@haymarketmedia.com.au)
[T @MrJosh86](https://twitter.com/MrJosh86)

After rediscovering the joy of PC gaming in recent years, I'm struggling to care about the whole next-gen console thing.



Art Director
David West

I'm enjoying this extended guest star spot on *PC & TA*, even if it means having to stare at a Mac all day long.

CONTACT US...

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Also, don't forget to check out the iPad version, packed with exclusive interactive content complementing the regular magazine. Here's a sample of what you can expect:

- **Video:** Get video tutorials, game trailers and more
- **Image Galleries:** Get a better look at some of the products reviewed
- **360 View:** Get up close with tech from every angle.
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Please limit letters
to 200 words, where
possible. Letters may be
edited for style and to a
more suitable length.

mention when AMD released the world's first 5Ghz processor. Yet Intel does a small incremental step forward and gets a full page spread. I really do love reading your magazine, but I think you have forgotten what AMD is all about. It's about being a cheaper alternative with simpler choice, better over-clocking and better gaming. (The new Xbox one + PS4 are perfect examples).

S. Pugh

John Gillooly says: We've got a bit of love for AMD this issue, we gave them a LOT of love last issue with their new video card release. I hope that eased your yearning!

HONEYBALL HATE

I enjoyed your article on Gmail and have to agree about the tags, which I switched off as soon as they appeared. Your comments on labels are spot on. In addition to using them to sort and store emails as a 'joint' (my wife and I share this email address) we use labels to let each other know when we have read an email. We have four labels - 1 Janet read left for Michael, 1 Michael read left for Janet, 2 Janet to action, 2 Michael to action - which we use to manage the emails. It works like a charm. The numbers on the labels are there only to keep them at the top of the label lists. Our labels are also coloured so they stand out. We also set up temporary labels as required, usually with a number, to keep together planning emails, for example when organising a trip. Later we replace the number with a 'z' to send the label to the bottom of the list. The label system is great in our opinion.

Michael

John Gillooly says: Glad you liked it, and thanks for the tip!



LETTER OF THE MONTH

This month's letter of the month will receive the STM HOOD laptop backpack thanks to the guys at STM.
www.stmbags.com

TOP SITE COMMENTS

What did you expect from an FPS? The genre IS all the same.
Morgan Paul Clifford admits a truism about CoD
Web ID: 363346

Damn I have a wife and two kids - which one to lose?

Edward Dekkers ponders what to sacrifice for a new electric car
Web ID: 363831

It doesn't bother me if I have to have a Sub to use it - PS+ works out to be better value than XB live Gold

Impending doom on the next gen of consoles
Web ID: 362569

When they find these guys a bullet to the head should make this kind of extortion less appealing.

Quinton Evans has passionate feelings about security
Web ID: 363713

If I didn't have a 4s, iPad 3 and MBPro, I could be tempted to the Google.

amcmo ponders the Dark Side
Web ID: 363710

\$1499 for a laptop with a 1366x768 display, 20gb SSD and a 4400 GPU - tell them they're dreaming.

Eamonn Keane doesn't think Acer's latest cuts the mustard
Web ID: 363160

Want to read more? Go to www.pcandtechauthority.com.au and search for the Web ID. And check out the Atomic forums: <http://forums.atomicmpc.com.au>

LETTER OF THE MONTH

Being the network admin for several primary schools, I am constantly amazed at the short-sightedness of Microsoft. Having to deploy Windows to hundreds of computers to be used by children, I have to be constantly vigilant and aware of the fact that a fresh install of Windows will display the Nine-MSN website by default in Internet Explorer. The content of this tabloid-style website is mostly very unsuitable for children. More often than not, a quick visit to www.ninemsn.com.au will display all sorts of shocking and revealing articles and pictures, which I know I would prefer my kids not to be showing an interest in - the longer they are ignorant of the antics of the Kardashians the better!

A. Croft

John Gillooly says: We absolutely agree - there is certainly more than enough bloatware on modern systems as it is. Kim Kardashian just adds insult to injury!

AMD LOVE

Just wanted to say that I really love reading your magazine every month, especially for the CPU reviews. However I am quite disappointed at the lack of AMD news. There is nearly always something about Intel's latest and greatest and yet hardly even a paragraph about AMD. I am particularly sad to see not even a

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JANUARY
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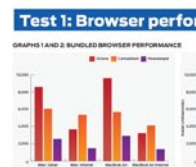
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"Your choice of OS makes much less difference than your choice of browser"



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TECH NEWS

LATEST TRENDS AND PRODUCTS IN THE WORLD OF TECHNOLOGY

APPLE REVEALS AUSTRALIAN GOVERNMENT DATA REQUESTS

THE US IS IN A LEAGUE OF ITS OWN FOR DATA ACCESS REQUESTS, BUT AUSTRALIA IS ALARMINGLY HIGH ON THE LIST TOO.



Apple has revealed government requests for information regarding its customer accounts, adding to the number of technology companies reporting on official demands for account information in the name of transparency.

According to Apple, the Australian government has made 74 requests relating to information on 75 accounts over the first half of 2013 until the end of June.

The iPhone maker acquiesced to 41 of those requests. The US and the UK are the number one and two countries on the list.

"Responding to an account request usually involves providing information about an account holder's iTunes or iCloud account, such as a name and an address," the company said.

"In very rare cases, we are asked to provide stored photos or email. We consider these requests very carefully and only provide account content in extremely limited circumstances."

In the wake of the Snowden leaks on government surveillance, Apple also took the opportunity to call for more

transparency in the US, where figures can only be reported in broad terms. The limited data revealed access requests were made for between 2000 and 3000 accounts, rather than a specific figure.

"At the time of this report, the US government does not allow Apple to disclose, except in broad ranges, the number of national security orders, the number of accounts affected by the orders, or whether content, such as emails, was disclosed," the company said. "We strongly oppose this gag order."

"We do not yet have an agreement that we feel adequately addresses our customers' right to know how often and under what circumstances we provide data to law-enforcement agencies."

The company also revealed it had been asked for "device information" more than 1000 times in Australia, but that these cases related to lost or stolen devices. That does put Australia in the top five worldwide. You can view the full report here: <http://www.apple.com/pr/pdf/131105reportongovernmentinforequests2.pdf>

VALE WILLIAM LOWE: THE MAN BEHIND THE IBM PC

WILLIAM LOWE PUSHED IBM TO CREATE ITS FIRST PC IN A SINGLE YEAR.

William C Lowe started at IBM in 1962 as a test engineer, and in 1980 had the idea to start a lab to create personal computers – and to do it in a single year.

A year later the team managed just that, and the company released the IBM Personal Computer, dubbed the 5150.

It was by no means the first PC – the Apple II was already on shelves – but it marked a shift for IBM.

"Here you had a large company, steeped in tradition, that had been willing and able to set aside its 'business as usual' methods to produce in volume a highly competitive, tiny computer of top quality, intended for both consumers and businesses," the company says on its own historical pages. "And IBM was able to do all that and roll out its first PC in just one year."

The company adds that at the time an IBM computer would cost as much as \$9 million and need 60 people to run it. The PC created by Lowe and his team changed that, using non-proprietary components and featuring open architecture. It cost \$1600 and ran MS-DOS 1.0.

Lowe later became the president of IBM's Entry Systems division, but attracted criticism because IBM struggled to keep up with "clones" – IBM-compatible PCs built by companies such as Dell and Compaq.

In 1988, Lowe moved to Xerox – and also provided backing to Steve Jobs when he was working on the NeXT platform.

Lowe died of a heart attack last month.



GOOGLE TO DEAL WITH CHROME PASSWORD SNOOPING

GOOGLE WILL SOON REQUIRE CHROME USERS TO SIGN IN BEFORE BEING ABLE TO SEE A LIST OF PASSWORDS SAVED IN THE BROWSER.

At the moment, going to "chrome://settings/passwords" when a user is logged into Chrome will bring up a list of stored credentials. Passwords are initially concealed with asterisks, but selecting one and clicking the Show button will reveal it in plain text.

There's no authentication procedure before accessing the information, so anyone who has access to your computer can easily grab your login details.

Google now appears to be addressing the problem, asking users to retype their Google password before accessing the full list.

"When you are authenticated, you won't need to re-authenticate any more for one minute," noted Google evangelist François Beaufort, in a post on Google+ ([https://](https://plus.google.com/+FrancoisBeaufort/posts/2zhYDGP822Z)

plus.google.com/+FrancoisBeaufort/posts/2zhYDGP822Z).

So far, the new re-authentication system is only in the experimental build of Chrome for Mac. Although Google has yet to confirm that it will extend to other versions, it seems likely to happen.

Security analyst Graham Cluley said he was glad to see Google had "finally seen sense".

"It was an easy option for them to put in place, and does provide a higher level of protection for users, so it's a mystery why it took them so long to admit that they were wrong in their previous stance," he said.

"No-one is saying that it's a 100% answer, but it will protect Chrome users against casual password-snooping by colleagues, friends and loved ones."

HOT... OR NOT

HOT

ANDROID KIT KAT

Even with a marketing tie-in more gratuitous than Eminem and Call of Duty, the latest version of Android is yet another step forward for the operating system, which will be rolling out to recent Nexus devices real soon now.



NOT

TOUCHWIZ

Samsung might be making excellent smartphone hardware, but in the face of the elegance of stock Android, the company's TouchWiz skin feels counterintuitive and clunky. Even Samsung now admits it needs work.



AMD IN THE BLACK, NO THANKS TO THE PC

AMD RETURNS TO PROFITABILITY WITH CONSOLE PUSH, BUT ITS PC BUSINESS IS SHRINKING.

AMD's made good on predictions that it would return to profit, thanks to demand from console manufacturers, but that might not be enough to make up for its shrinking PC business.

In a mixed financial report, the chip maker said it has benefited from supplying semi-custom processors for the Xbox One and the PlayStation 4, swinging back to a third-quarter profit and beating analyst expectations.

But PC chip sales, AMD's core business, shrank 15% year on year in what CEO Rory Read admitted was the end of the "go-go era" of growth. "There is no doubt that the PC client segment, particularly at the entry level, will feel pressure from tablets," he said. "It's a competitive space - we are going to be in there and we are going to compete because we have a very good product."

Despite Read's bullishness, analysts compared AMD's performance unfavourably with Intel, which posted bigger profits earlier this week and saw PC chip sales grow 3.5% year on year.

"We see no shortcut to AMD to regain market share [in PCs]," wrote Auriga analyst Daniel Berenbaum. "Given past missteps, we have low confidence in AMD's design and manufacturing execution."

Meanwhile Intel is successfully pushing into mobile with its next-generation chips

for PCs and tablets, codenamed Haswell and Bay Trail.

"They probably lost market share to Intel," said Stifel Nicolaus analyst Kevin Cassidy. "That was a surprise. Intel's Bay Trail and Haswell are coming in on top of where AMD was."

Read promised that tablets and mobile devices would form a "significant portion" of AMD's business in future. "We need to move and attack the new opportunities where the market's going, and that's what we are doing."

AMD reported a net profit in the third quarter of \$48 million, up from a loss of \$157 million this time last year. Revenue was up to \$1.46 billion, from \$1.27 billion over the

same period. Sales from AMD's Computing Solutions division, which includes PC chips, fell to \$790 million, from \$927 million in the third quarter of 2012.

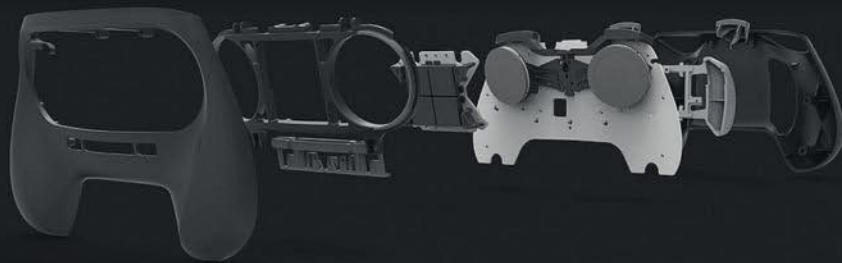


GAMING NEWS

ALL THE NEWS THAT'S FIT TO PRINT FROM THE GAMING WORLD

VALVE TO ANNOUNCE A DOZEN HARDWARE PARTNERS AT CES 2014

AT LEAST 12 STEAM MACHINE VENDORS WILL BE ANNOUNCED IN JANUARY, DURING THE CONSUMER ELECTRONICS SHOW IN LAS VEGAS.



There might actually be even more reason for gamers to keep an eye on next year's CES show, with news that Valve will be making some big announcements at the event.

Talking to Bloomberg, Valve's Greg Coomber said the company is working with "more than a dozen partners" to bring SteamOS-powered machines to

gamer's living rooms. Some are small operations, others are big computer makers, according to Coomber.

Valve has revealed that the range of devices will not be compatible with all Steam games, due to SteamOS being Linux-based. With different price points and specs, the lower-end ones could be quite cheap indeed.

SOUTH PARK: STICK OF TRUTH PUSHED BACK TO MARCH 2014

<CARTMAN/>GODDAMMIT!</CARTMAN>

If you were looking forward to getting your virtual South Park on this year... tough news. And straight from Matt Stone and Trey Parker, too!

"We always wanted the game to feel like you're actually in an episode of South Park," says Matt Stone and Trey Parker in today's delay announcement. "Getting the game up to the crappy standards of the show has been a real challenge and we're excited to say it's taken way longer than we thought it would."

Which adds up to the game now set for a March 6, 2014 release date. Here's hoping that the PC version won't be delayed even further, as publisher Ubisoft is notorious for such meaningless delays.



EA PULLS PLUG ON COMMAND & CONQUER REBOOT

THE UPCOMING FREE TO PLAY COMMAND & CONQUER HAS BEEN KNOCKED ON THE HEAD, AND ITS STUDIO SHUT DOWN. BUT IT'S NOT OVER YET...



If you were looking forward to a free to play Command & Conquer on the shiny new Frostbite 3 engine this year, cool your boots. Victory Studios announced today, via the game's official site, that the game has officially ceased production.

"Part of being in a creative team is the understanding that not all of your choices are going to work out. In this case, we shifted the game away from campaign mode and built an economy-based, multiplayer experience. Your feedback from the alpha trial is clear: We are not making the game you want to play. That is why, after much difficult deliberation, we have decided to cease production of this version of the game. Although we deeply respect the great work done by our talented team, ultimately it's about getting you the game you expect and deserve."

The announcement also promises that EA will refund all money so far spent on the game during its alpha phase.

It also means the effective shutting down of the studio, although – according to Game Informer – EA's working hard to find placements for all affected staff.

However, it's not all doom and gloom, as the announcement continues: "We have already begun looking at a number of alternatives to get the game back on track. We look forward to sharing more news about the franchise as it develops. Thank you again for your participation and support."



"Nearly flawless; buy it now. 9/10"

- WIRED

"It's our new Editors' Choice for ultraportable gaming laptops."

- PC Mag

"The Blade offers unprecedented portability and style."

- IGN

"Sexy, Super thin and Portable. 9/10"

- Maximum PC

"A sexy and powerful gaming laptop with an amazingly slim profile. 4/5"

- Laptop Magazine

"It looks fantastic, exhibits top-notch performance in both day-to-day use and gaming. 4.5/5"

- Techradar

"The Ultimate 14" Laptop"

- Mashable

"Should you buy this? Yes."

- Gizmodo



THE WORLD'S THINNEST GAMING LAPTOP

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au.razerzone.com

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THE NEWEST, HOTTEST PRODUCTS THAT WE WANT TO GET OUR HANDS ON!



◀ LOGITECH ULTRATHIN KEYBOARD FOLIO

If you're an iPad owner, it sometimes seems like the world is falling over itself to throw peripherals such as cases at you. So it's great to see some solid options for other tablets, especially Samsung's popular Galaxy Tab.

This Keyboard Folio has a key layout just like a full-sized keyboard, and uses lightweight but strong clips to keep it securely attached to your tablet at all times. It connects with your Tab via Bluetooth, and is a great way to add some real content creation power to your tablet.

www.logitech.com.au

▶ LEGO MINDSTORMS EV3

Ah, is there anything quite so sweet as Lego? You can combine it with anything, and both Lego and the other thing just get that much cooler. Star Wars and Lego? Fantastic. Marvel and Lego? You betcha.

And robotics and Lego? Aw, yeah!

The latest Mindstorms kit is out, and it features more sensors and more connectivity than ever before. You can build everything from snake-like crawlers to walking robots, and then control them straight from a smartphone or tablet.

mindstorms.lego.com





▶ PANASONIC LUMIX DMC-GM1

Panasonic's latest compact system camera comes in a handy size for holiday snapping, but doesn't skimp on the features and image quality.

The DMC-GM1 features Wi-Fi connectivity for instant sharing via the Panasonic Image app, and boasts a motor-driven shutter to cut down on the camera's size. Built around a single magnesium alloy frame, the GM1 is as sturdy as it is easy to use, too. The GM1 comes as a kit with a LUMIX G VARIO 12-32mm/F3.5-5.6 ASPH/MEGA OIS lens.

au.panasonic.com

▶ TEAC PBT1000 FREESTYLER

Ah, the Boombox – such an important musical icon, most typically seen on the shoulders of seriously passionate music lovers who just have to share the beats with all and sundry.

TEAC's taken a nostalgic leaf out of that old-style playbook and delivered a refreshed, modern take on the classic that still wouldn't look out of place on modern shoulders. Able to stream music from any smartphone, the Freestyler includes an FM radio, USB and SD card ports, and a top slot for Mini iPads and tablets.

You can even connect a microphone for a bit of karaoke action. If you're into that kind of thing.

www.teac.com.au



▼ DENON DHT-T100 TV SPEAKER BASE

So, you've got a shiny new and fiendishly thin smart TV – but the sound... man. Modern TVs are so thin that you just can't get good sound from them, especially when it comes to good bass notes.

That's where Denon's new Speaker Base comes into play.

Sitting elegantly under your television, this slim but deep black unit offers premium audio playback. With dual 2x5in oval drivers on the front panel, and dual half-inch dome tweeters backed up by digital amp, the TV Speaker Base boosts audio enjoyment immensely. With multiple sound modes, it'll match whatever your listening and filmic tastes are.

And it can hold up to 27kg of weight, enough for even the biggest televisions.

www.denon.com.au



What will 2014 bring to tech lovers?

ROSALYN PAGE INVESTIGATES THE STATE OF PLAY FOR OUR NATIONAL BROADBAND NETWORK, AND WHAT A NEW GOVERNMENT MAY MEAN

As the silly season gets into gear and we settle into long, hot days of gaming, reading ebooks and tinkering with some tech, it's time to think about what's on the horizon for tech enthusiasts in the coming year.

It's always dangerous to make predictions, but Investigator's going to break a long-standing New Year's resolution and do a bit of crystal-ball gazing. Here are some cautious forecasts on the coming twelve months in the world of tech.

NBN

The NBN is one of the biggest issues for tech users this year and beyond. The minister Malcolm Turnbull is overseeing several reviews of the network including the makeup of technology and the extent of fibre, cost and timelines.

The Coalition has kept saying all along that it intends to build a fibre to the node network. Supporters of a complete fibre network are hoping that they can show there's enough community support for the fibre to the premises network to pressure the minister and the government into building the technically superior FTTP network promised by Labor.

There's a growing number of save the NBN websites popping up and the guys behind the 'Liberal Party of Australia: Reconsider your plan for a 'FTTN' NBN in favour of a superior 'FTTH' NBN' petition on change.org is nearing 300,000. Their campaign is running ads and encouraging supporters to get vocal with their local MP.

Guess-o-meter: FTTP unlikely to be greenlighted, but here's hoping anyway.

GLOBAL ROAMING

The incoming government has mentioned that this is one area that it might look at, but they may just be because they're worried about justifying their own exorbitant phone bills if the

"Piracy is like a hydra: As one site for illegal downloading gets closed, another few open."

expensesgate saga keeps going. Still, an MP with a huge global roaming bill just might have a bit of motivation to take on the telcos. This year ACMA has introduced better rules so that telcos must inform users about phone and data costs and how to cut-off global roaming services when they're overseas, but the costs are still sky high.

If, as suggested, the ACCC is charged with looking into the issue, then the government could give legislative support to pricing controls and shed light on why these costs can go unregulated. Australia is nowhere near the EU, which has mandated maximum global roaming costs, so we're still subject to the dark arts of international roaming costs by telcos.

Guess-o-meter: If the Foreign Minister's bill gets too high, look out for tough talk to telcos.

PIRACY

The newly-minted conservative government has already started talking about ways to combat piracy and it wants input from internet providers and content creators. Could Australia get a

Three Strikes policy or will there be a push to get ISPs to take a more active role issuing infringement notices? Is there an appetite for prosecution? It's not clear yet, but the government has already said it will look at measures such as blocking websites. Piracy is like a hydra: as one site for illegal downloading gets shutdown another few open up to meet the appetite for access to quick, easy, DRM-free content. The Isohunt website takedown and the speedy creation of mirror sites is a case in point.

Guess-o-meter: Piracy is a global problem. When has blocking websites ever worked? Expect some tough talk but not many real solutions.



ROSALYN PAGE

has been a journalist for over 10 years specialising in the areas of consumer issues, technology and lifestyle. Rosalyn is the 2008 winner of the Best Consumer Technology Journalist at the IT Journalism awards. Her work is published in a range of newspapers and magazines



SMARTPHONE SECURITY

At the risk of flaming fires of the Android vs iOS argument, the stats show that malware and other nasties infect Android devices in greater numbers than iOS. This puts people's sensitive information at risk and more needs to be done to weed out questionable apps from the Google Play Store.

At the same time, both the Apple App Store and the Play store need to do more to tighten the rules around apps targeted at children. Too many free apps require excessive payments for tokens and other components to make them work properly. Some Android apps for kids have been found to get access to geo-location and other sensitive information without proper permissions.

Guess-o-meter: Apple and Google unlikely to hear the faint cry of complaints over the sound of payments clicking over.

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GT series



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GE series



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The actual product may differ from product image shown.



***Merry X'mas
Gifts***



LG monitor



Gaming luxury package



Helicopter



Secret gift (more to come)



Au.msi.com



www.facebook.com/msiaus



HOW TO

BUILD

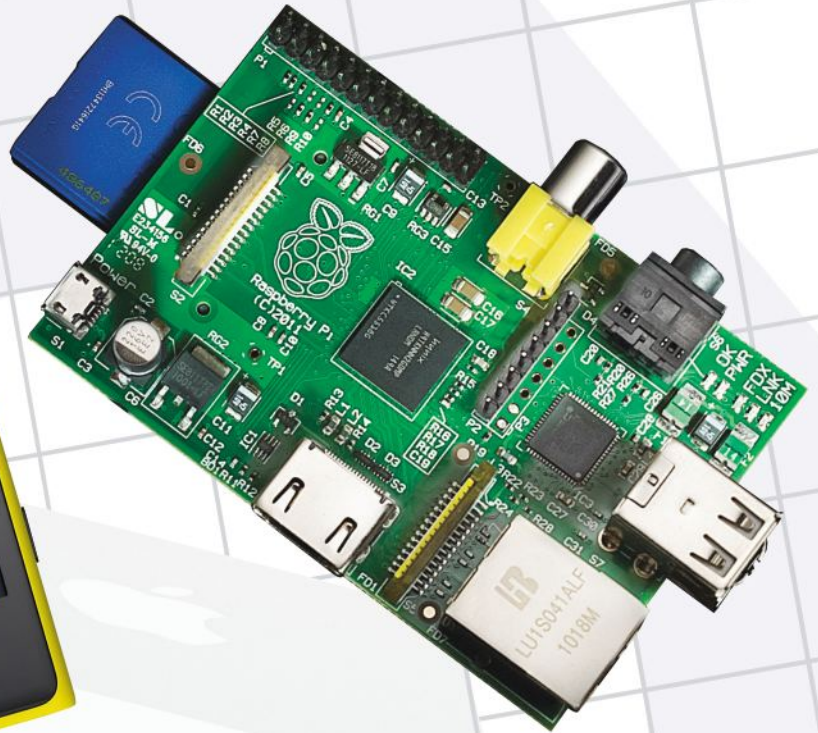
FIX

CREATE

& GET THE MOST FROM YOUR TECH!

BORED? DON'T BE. WE HAVE 20 IDEAS FOR TECH PROJECTS TO
FILL YOUR SPARE TIME, FROM MAKING A RASPBERRY PI WILDLIFE
CAMERA TO EXTENDING YOUR WIRELESS COVERAGE AND
CREATING YOUR OWN ANIMATED GIFS

CONTRIBUTORS: JONATHAN BRAY, SHONA GHOSH, DARIEN GRAHAM-SMITH,
GARETH HALFACREE, NICOLE KOBIE, SASHA MULLER



MAKE A MOTION-SENSING CAMERA WITH THE RASPBERRY PI

WHAT YOU'LL NEED

- A Raspberry Pi Model A or Model B (<http://tinyurl.com/m6db7lk> and <http://tinyurl.com/lztr9az>)
- A Raspberry Pi Camera Module (<http://tinyurl.com/ldzajf4>)
- A case with a camera mount (a quick Google search will show the options out on the market, and new designs are being introduced at a rapid rate).
- An SD card with an up-to-date Raspbian installation
- A monitor, keyboard and network connection to set up the software

The Raspberry Pi made headlines earlier this year when the Kenya Wildlife Service used it to install a network of remote cameras to monitor animals and catch poachers.

Though it's unlikely poachers are a problem in your garden, you can use the same technology to keep an eye on the wildlife in your backyard - albeit with more possums, and fewer lions.

If you haven't used a Raspberry Pi before, you'll need to install the Raspbian OS to your SD card and make sure it's up to date.

The first step is to attach the Raspberry Pi Camera Module to the Camera Serial Interface (CSI) port on the top of the Raspberry Pi. This small slot-like port is found on the bottom right of the board's top surface, between the HDMI port and the Ethernet port. Pull the tab gently up, then push the bare end of the Camera Module's ribbon cable into the slot, with the silver contacts on the cable facing towards the left of the board. When the cable is at the bottom of the slot, hold it in place with one hand while pushing the tab back down with the other hand to secure it in place.

Connect the Pi to a monitor, keyboard and internet access. If you have a Model A, you'll need to use a USB to Ethernet or Wi-Fi dongle to download software, but this can be

removed when the camera is in use.

When the Pi has booted, log in using the "pi" account and load the Software Configuration Tool by typing:

```
sudo raspi-config
```

Scroll down the list to the Enable Camera option and select it with the Enter key. Choose "Enable" in the menu that appears, then choose Finish and then Yes when asked to reboot.

When the Pi has rebooted, log in and install the software that will drive the motion-sensing camera - a Python module for performing image analysis and manipulation, plus a tool for keeping the script running - by typing:

```
sudo apt-get install python-imaging-tk screen
```

Then download the PiCam Python script, which has been developed by Raspberry Pi community members and shared on the official forums:

```
wget https://raw.github.com/ghalfacree/bash-scripts/master/picam.py
```

Finally, create a directory for the script to store its images:

```
mkdir picam
```

With the software installed, you can disconnect your Pi from the network and position it ready to capture images. To run the capture software, first make it executable by typing:

```
chmod +x picam.py
```

Then run it by typing:

```
./picam.py
```

The Python script takes continuous low-resolution



► Your Raspberry Pi wildlife camera will capture comings and goings in your garden

images and compares them for changes caused by something moving in the camera's field of vision. When a change is detected, the camera takes a higher-resolution snapshot and then goes back to looking for changes.

The software can need fine-tuning, especially when close to plants, which can move in the wind: open the script in a text editor and experiment with the options to adjust sensitivity or remove areas from being analysed. Images captured are placed in the "picam" folder (only higher-res images; the lo-res images are discarded). To stop the script, press Ctrl+C on the keyboard.

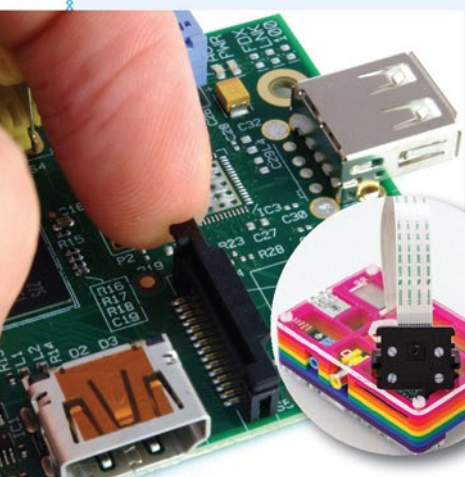
If you're placing your camera in an inaccessible location, you can use a wireless network dongle to control it over the network. Find your Pi's IP address by typing:

```
Ifconfig
```

Connect to this address using an SSH client such as PuTTY for Windows, and run the script using the Screen utility to prevent it from closing when you disconnect:

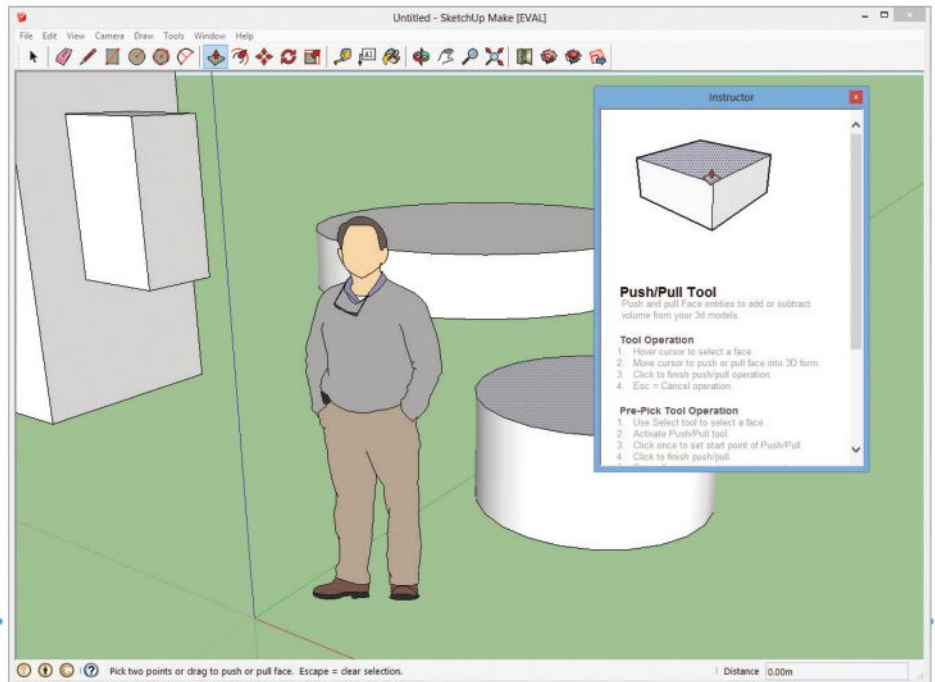
```
screen /home/pi/picam.py
```

Since the Pi is low power, you can connect it to a solar-powered battery pack. Combined with a waterproof case, such as the PiCE from Elson Designs, it's possible to turn the Pi into a wildlife camera that takes impressive images - even in urban gardens.



TEACH YOURSELF 3D MODELLING

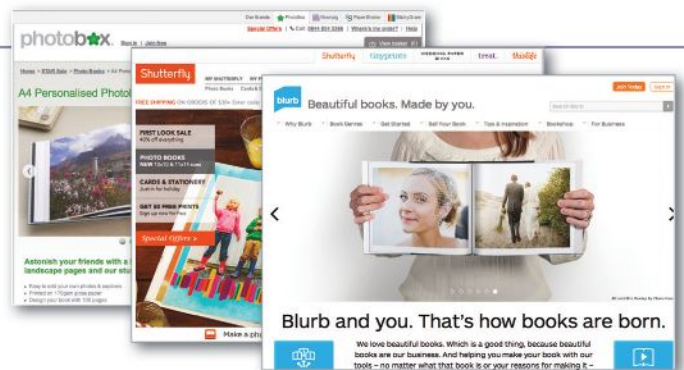
3D design may seem daunting, but it's a rich and rewarding hobby, and you don't need to shell out a penny to get started. Two popular options are the open-source Blender project (www.blender.org) and SketchUp (www.sketchup.com), a commercial package that's available in a free beginner edition called SketchUp Make. Blender offers a manual in the form of a wiki (<http://sketchup.wikia.com>), while the SketchUp website offers a wealth of videos and self-paced tutorials – as well as an in-app Instructor window to walk you through various tools as you work. Both support animation, too, so you can create and render cool 3D videos – and if you choose to invest in a 3D printer, you can design and produce your own real-world objects.



CREATE YOUR OWN PHOTO BOOK

Digital cameras have changed how we take photos – and how we view them, with many pictures hidden away on PCs. Creating a photo book is an easy way to get your pictures back in your hands. Imaging software – such as iPhoto and Photoshop Elements – lets you make a book and have it printed from affiliated sites, but you can also create your book directly from

your printer of choice. PhotoBox (www.photobox.com.au), HP's Shutterfly (www.shutterfly.com), and Blurb (au.blurb.com) all offer free software to import your photos (or grab them from Facebook or Instagram), add captions, and design the layout and print settings for your creation. However, you'll want to edit your photos before starting,



IMPROVE YOUR NIGHT PHOTOGRAPHY

Ever wondered how professional photographers manage to snap such clean nightscapes and star trails? Well, wonder no longer: all you need is a DSLR, a tripod, a cheap remote trigger (you can buy them on ebay for around \$20-\$40) – and, optionally, a warm jacket. The trick is to capture your scene with a long exposure at ISO 100. Depending on how dark it is, exposure times can run into minutes or even hours, so you'll want to make sure the length of time the shutter is open for is correct the first time. There's a simple trick to this:

pop your camera on the tripod, put it into aperture priority mode, set the camera to ISO 6400 and snap your scene. Take note of the shutter speed and aperture used, switch to Manual, and set the camera to ISO 100, with the same aperture as before. The exposure time you need can be derived simply by converting the number of seconds required for the ISO 6400 test shot directly into minutes. A two-second exposure at ISO 6400 will therefore be a two-minute shot at ISO 100; a 1/60s snap at ISO 6400 works out at one second.

EXTEND YOUR WIRELESS NETWORK AND ELIMINATE DEAD SPOTS

WHAT YOU'LL NEED

- An old router that supports wireless repeating or DD-WRT firmware
- A lot of patience
- Or a spare \$50-\$90

Wireless networking technology has come a long way since the days of 802.11g and 54Mbps/sec transfer speeds, but no matter how much you spend on your router, there will likely be a few spots around the house where the wireless just won't reach.

Using a variety of different methods, however, it's possible to eliminate black spots without having to replace your router, or shell out a fortune.

RE-USE AND RECYCLE

Your old wireless router may not have been up to the job of spreading wireless around the whole house, but you might be able to use it to give your new one a helping hand.

Many routers can be transformed into wireless repeaters. A repeater logs into your existing wireless network just like any other device, creating a secondary wireless network, thus increasing the area of your current network. Have a dig around in the web settings pages of your router, and look for the "bridge" or "wireless repeating" section - you'll need to configure the router to log in to your existing wireless network before it can talk to the base station router.

There are two types of wireless repeating, or "bridging", methods available. With universal repeating, simply connect your repeater router to the existing network wirelessly. You'll then have two wireless networks you can connect to, effectively doubling its overall range.

The wireless distribution system (WDS) method is more complicated

to set up. It needs a tighter bonding between the two routers, requiring setup on both the base station (your current router) and the old router you're using as an extender. Since WDS isn't a part of the 802.11 set of wireless standards, incompatibilities are common. Confusingly, the terms are often used interchangeably on router settings pages, so you may have to experiment to get things to work.

If your router doesn't have a wireless repeating function, or you just can't get it to work, there is another alternative. Many routers are compatible with the open-source DD-WRT firmware, which supports both types of repeating, and is easier to set up. To find out if your router is compatible with DD-WRT, go to the router database page on the DD-WRT website (www.dd-wrt.com) and type your router's model name into the search field.

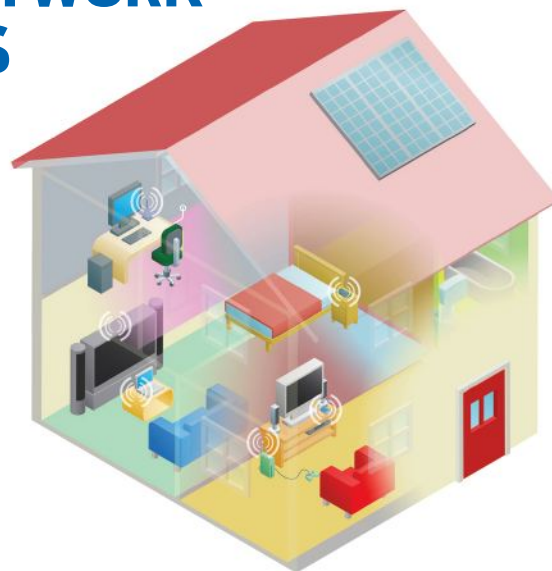
Once you've done that, download the firmware file for your router, log on to your router and update it using the DD-WRT firmware file. This should take only a minute or two. Your next step will be to log on to your router, put the router into Repeater Bridge mode (under the Wireless Basic Settings tab), and get everything set up. For full instructions on how to set it up, visit the DD-WRT wiki (www.dd-wrt.com/wiki).

It's a touch fiddly and may take some time, but that's part of the joy of this project. Persevere and you'll have a bigger, better wireless network - and without having to spend a cent.

Alternatively, if you really can't face spending an hour or two wrangling with wireless network settings and updating firmware, dedicated wireless repeaters, often called Range Extenders, from companies like Netgear or D-Link are far easier to set up. Just make sure you get a dual band model, designed to extend both 5GHz and 2.4GHz networks, if you have a dual band router.

GET BIGGER ANTENNAE

If you don't have spare cash, a cheaper and even simpler way of boosting your wireless network coverage is simply



to replace the antennae on the rear of your router with bigger ones. However, this obviously won't work with modern devices that have internal antennae. Some other routers have external aerials whose attachments don't allow them to be removed; some Buffalo routers have such captive antennae.

However, if you own a router with threaded fittings on the rear (called SMA connections), you'll be able to buy powerful, high-gain replacements. You'll need to check your router's manual to find out the specs of the stock antennae first - high gain replacements will usually cost \$10-\$20 each.

This method isn't as effective as using a repeater or extender, but if all you need is to push your Wi-Fi limit out a few metres further, it's cheap, quick and requires no technical knowledge or expertise.



CREATE A STOP-MOTION ANIMATION

WHAT YOU'LL NEED

- A laptop/PC running Windows
- A compact camera, DSLR or webcam
- Video-editing software

Stop motion is a fun way to create animated videos. At its simplest, all you need to do to create a stop-motion clip is take a photo of a scene, slightly move one or more elements, then take another photo, and so on. When viewed in rapid succession, the series of photos becomes a film, showing the items moving around on their own.

The concept dates back to the 19th century, but modern technology makes it easier than ever to shoot stop motion.

You can create your first stop-motion video using nothing more than a digital camera and a copy of Microsoft Windows Movie Maker (available for free as part of the Windows Live Essentials pack - download it from <http://tinyurl.com/o8smeu2>).

Before you start taking your photos, it's a good idea to work out a storyboard in advance. Think about composition too: life is much easier if you can fit your whole animation into one static scene, since it's very difficult to pan and zoom smoothly when you're shooting one frame at a time.

For the most professional-looking results, we recommend that you use a stand or tripod to hold the camera precisely in place. Ideally, you might even use a remote shutter release, so that the camera's positioning can't be knocked off even slightly by repeatedly pressing the shutter button.

Once you've taken your pictures, all you have to do is drag them into

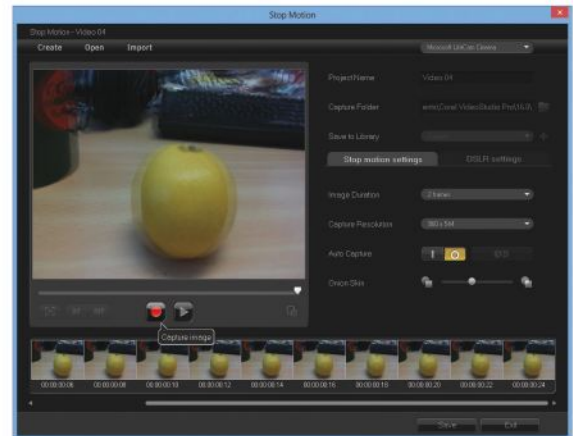
Movie Maker and set the playback rate to something suitable. For example, to make your animation play back at 10fps, select all the photos in your project (press Ctrl+A), then go to Video Tools | Edit and set the duration to 0.1 second. Naturally you won't want to apply any transitions - the impression you want to give is that all your frames flow seamlessly together.

Hit the Play button in the preview window on the left to see your new animation: if some parts play too quickly, you can duplicate a frame by selecting it and hitting Ctrl+C followed by Ctrl+V. If a part is running too slowly, try dropping a frame or two. You can also add narration or music using the tools under the Home tab.

If you're ready to be more ambitious, there are several commercial video-editing packages that offer stop-motion-specific tools. One powerful and affordable option is Corel VideoStudio Pro X6 (<http://tinyurl.com/n92n86t>). It costs \$99 to download, but you can take advantage of a free 30-day trial that should give you more than enough time to try creating your first project.

VideoStudio's stop-motion module greatly simplifies the process of capturing footage. Hook up a USB camera device - such as a regular webcam - and VideoStudio Pro will show you a live preview of the scene, which you can set up just as you wish.

When you're happy, click the red Record button to capture the frame; then adjust the scene, and repeat as many times as you like to create your animation. For maximum quality, it's also possible to capture frames from a connected DSLR - although at present only a selection of Canon models are



▲ "Onion skinning" shows a semi-transparent view of the last captured frame, overlaid onto the live view from your camera

supported (see <http://tinyurl.com/mol38h5> for the full list).

To make life easier, VideoStudio Pro X6 offers an auto-capture mode, wherein the shutter can be set to fire once every five seconds - for example - so you can set up and capture progressive frames without having to repeatedly go back to the PC and press the Record button each time.

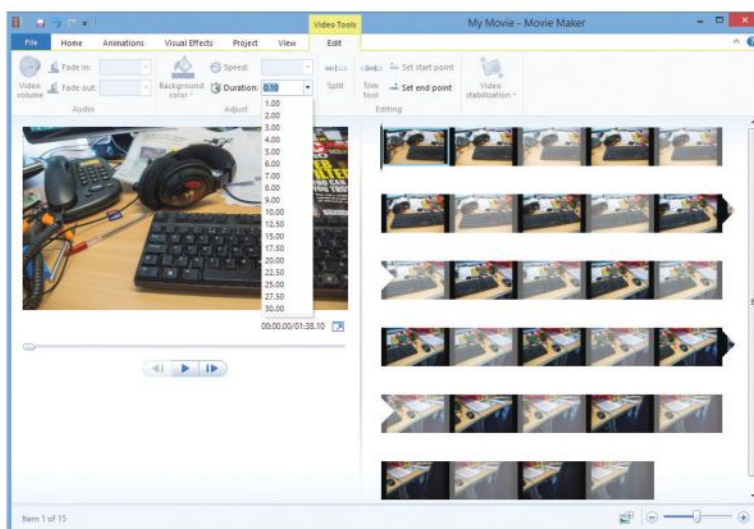
It's possible to push the capture interval up to minutes or hours, so you can also capture time-lapse videos of slow processes, such as the sun crossing the sky or a sunflower growing.

Perhaps the most useful feature for stop-motion capture is "onion skinning", which optionally superimposes a translucent image of your last captured frame onto the live view from the camera. This lets you see exactly what's changed between the two scenes, making it easier to set up smooth and consistent movements. It can also be a godsend if you accidentally move your camera halfway through a capture session and need to put it back in exactly the right place.

When you're done, you can preview your animation in the Stop Motion window: if things are moving too quickly or slowly, you can use the Image Duration dropdown to set the display duration for each of your captured frames, from one to 30 frames. You can also optionally delete and reorder frames.

When you save your work and exit the Stop Motion module, all the frames captured are automatically compiled into a single sequence. You can then edit this on the main timeline like any other video clip - or, perhaps, add music and titles. When you're happy with your work, VideoStudio Pro X6's Share module lets you upload your work directly to YouTube, Facebook, Vimeo or Flickr.

◀ You can create a stop-motion animation in Windows Movie Maker by importing a folder full of still images



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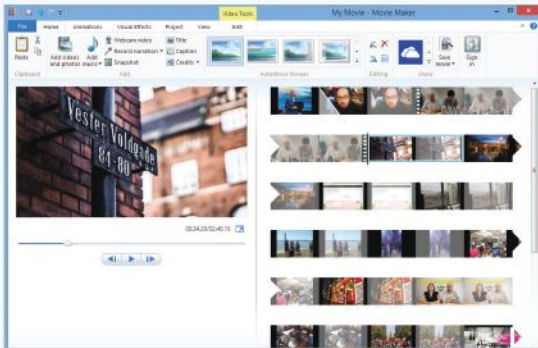


FORCE M7



FORCE M7 THOR

MAKE A VIDEO OF YOUR 2013 HIGHLIGHTS – AND SHARE IT



Download the free Windows Movie Maker as part of Windows Live Essentials (<http://tinyurl.com/o8smeu2>). Drag your favourite photos and video clips – perhaps from your phone or a DSLR – into the Movie Maker window, and shuffle them into

the order you want. Click one of the AutoMovie themes, under the Home tab, to merge your photos and video clips into a seamless, professional-looking presentation – or click on the various icons under the Home And Animations tab to apply your own titles, voice-overs and transitions. Use the Split and Trim tools (under the Video Tools | Edit tab) to snip out just the best parts of your videos, and click Home | Add Music to provide a soundtrack.

Once complete, the File | Publish Movie menu lets you upload it straight to Facebook, YouTube and other services. Be warned, it's a breach of copyright to publish a video that uses commercial music, or clips from TV shows or films, and some services will block such content.

ENCRYPT YOUR DATA



If you're worried about ASIO being on your back, there are several free encryption tools worth trying out.

Open-source software TrueCrypt (www.truecrypt.org) offers various options for encrypting all or part of a hard disk or USB drive. The software renders sensitive files unreadable without the key, and lets you drop them into an encrypted "locker" within the drive. However, some functions will take up considerable room on your PC, and the encryption process can be time-consuming.

If you're on the Pro or Enterprise editions of Windows 8, Microsoft offers a full-disk encryption feature, BitLocker. As with TrueCrypt, BitLocker protects your files by encrypting whole volumes, using 128-bit or 256-bit encryption. Activate the feature through the control panel's security settings – but you'll need to make sure your drive has two NTFS partitions to meet BitLocker's requirements. BitLocker also comes with the Ultimate and Enterprise editions of Vista and Windows 7.

REVISE ONLINE PRIVACY SETTINGS

Facebook seems to change its privacy terms on a near-weekly basis, making it easy to miss amendments and not realise how your data is displayed and shared on social networks. If you have a spare hour, it's wise to double-check all is as it should be. In Facebook, click the settings icon in the top-right corner and go through each one in the list. To see what other people can see on your page, click the lock icon and select "who can see my stuff".

This year, Twitter added a tracking system that follows you around the web, in order to display targeted advertising. To turn it off, go to Settings, and in the Security And Privacy panel, untick the box next to "Promoted content".

In both services, it's worth double-checking which apps you have enabled, and switching off any unnecessary ones; you may

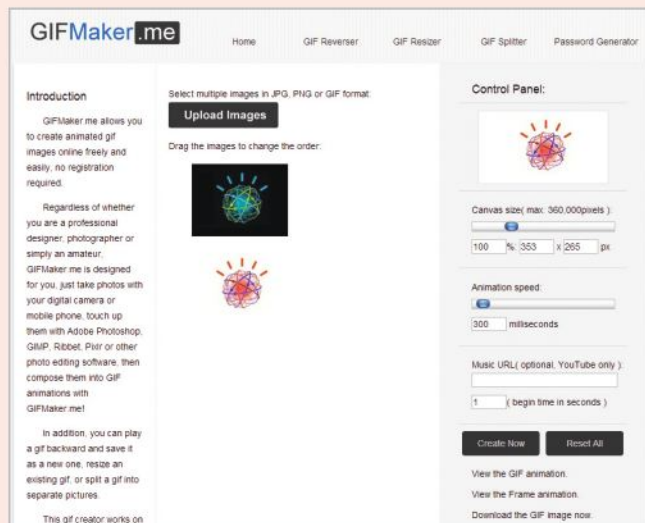


not be using them anymore, but they can still harvest your data. For other services, rinse and repeat – and hope their privacy settings aren't updated the following day.

CREATE YOUR OWN ANIMATED GIF

Like parachute pants, disco and Take That, animated GIFs have made a comeback. Free, web-based GIF generators such as GIFMaker.me do the animation work for you. You can upload images, set the animation speed, add music via a YouTube URL and download the final GIF in about a minute.

Purists can do it from scratch using Adobe Photoshop. Create multiple image layers, then use the animation tool to change layer visibility one at a time, set the timing and export the final image as a GIF.



MAKE YOUR OWN TOUCHSCREEN GLOVES

It's cold, but you want to use your smartphone. You can have the best of both worlds with a pair of conductive gloves, and it's easy to make your own. All you need is conductive thread – easily available online – and a needle. Sew a few stitches into the tip of the glove's finger, keeping them close together for tapping accuracy. On the inside of the finger, leave a bit of loose thread or some knots – your finger needs to touch the thread in order for it to work. It's neater than cutting a hole in your glove's finger, and warmer, too.



LABEL PLUGS

Trying to trace a cable through the spaghetti under your desk is never a good look – and it's embarrassing when you yank out the wrong one. Labelling your plugs takes five minutes, and you'll never regret it. For mains connectors, you can attach a sticker to the back of each plug (perhaps using colours to represent different types of appliance), and label them in marker. Alternatively, wrap masking tape around the neck of any cable – or, if you want to push the boat out, you can buy dedicated colour-coded labels (<http://tinyurl.com/o7f8bt6>).

DESIGN YOUR OWN RINGTONE

Buying a custom ringtone is wasteful, with dodgy ads advertising the latest Justin Bieber song for \$7. However, there are free apps that let you capture snippets of songs or record your own. Ringtone Maker (<http://tinyurl.com/mc9hv54>) is the most popular choice on Android; while it's free, it plays ads unless you pay for the premium version.

iPhone users can use iTunes's ringtone library to capture sound snippets and set them as ringtones. If you want to edit your sound clip, check out free audio software Audacity.

REFRESH AN OLD TABLET TO CYANOGENMOD

If you have an old Android tablet or smartphone kicking around, or are tired of a skinned edition of the OS, refresh it by switching to CyanogenMod, an alternative version of Android. At the time of writing, this isn't easy – luckily, we've written a full guide with all the steps to rooting your device and installing CyanogenMod (<http://tinyurl.com/kc6dkuv>).

However, the developers are working on an easier, one-click installation app that should be available soon. Search for it on Google Play, and if your device is supported, you could save yourself some work. But don't forget: rooting your device might void your warranty, and there's a chance you could brick it.

MAKE YOUR PHONE CONTEXT-AWARE WITH NFC

If your phone has NFC, chances are you haven't used it. With the help of a few stickers – only a few bucks on eBay – and the NFC Task Launcher app, you can make your phone context-aware.

You can put your phone automatically into Drive mode when you pop it in the windscreen

mount, or put it into silent when you pop your phone onto your bedside table – it's child's play to set up. Simply create a task in the app, tap the phone to the tag to write to it, and the next time you touch your phone to the tag, the task will be carried out instantly.

BECOME A TECH VENTURE CAPITALIST

You don't need millions of dollars to invest in tech start-ups: you can help shape their success via crowdfunding sites, such as Kickstarter, Pozible and Indiegogo. You're not, strictly speaking, ordering a product. What you're backing may not ever be made. The project may not be fully funded (although you'll get your money back) or the developers may not be able to actually build it. Flipping through the tech sections on both sites reveals a fantastic array of weird and wonderful ideas – we quite like The EX¹, a circuit board 3D Printer, and Sigmo, a real-time voice-translating device.

The EX¹ - rapid 3D printing of circuit boards
by Cartesian Co.

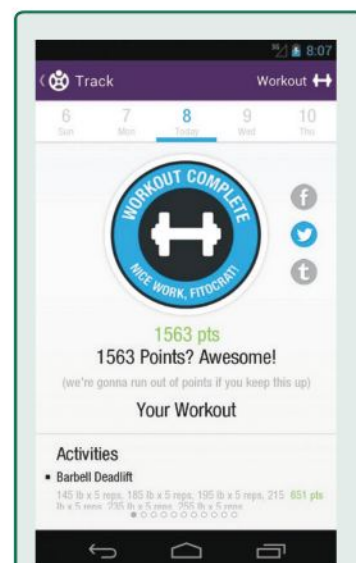
186 backers
\$89,385 pledged of \$30,000 goal
27 days to go

Back This Project
\$1 minimum pledge

This project will be funded on Wednesday, Dec 11, 6:58am EST.

Funding period: Feb 11, 2013 - Dec 11, 2013 (30 days)

The EX¹ makes printing circuits as quick and easy as printing a photo - allowing you to print on the material of your choice.



SET UP AN ONLINE FITNESS REGIME

If you're looking to get in better shape, there is – of course – an app for that. Fitocracy (www.fitocracy.com) is a popular tracking site, and cleverly turns training into a game, giving you points for achievements. Walking up 15 flights of stairs, for example, is worth 30 points, and you can share your progress on Twitter and Facebook if you want to beg encouragement from friends. If you don't want to type in each and every one of your workouts, consider a fitness tracking band such as Fitbit.

TURN AN OLD LAPTOP OR PC INTO A NAS BOX

If there's an old desktop PC or laptop gathering dust in the loft, then why not transform it into a fully functioning NAS appliance with FreeNAS (www.freenas.org)? If you fancy streaming movies, music and photos, or just want to keep data backed up over a home network, this can save you a packet over dedicated devices.

Don't mistake this for the cheap and cheerful option: FreeNAS is a powerful, open-source NAS operating system that uses the same secure ZFS file system employed by high-end business NAS appliances. Installation isn't too tricky: simply download

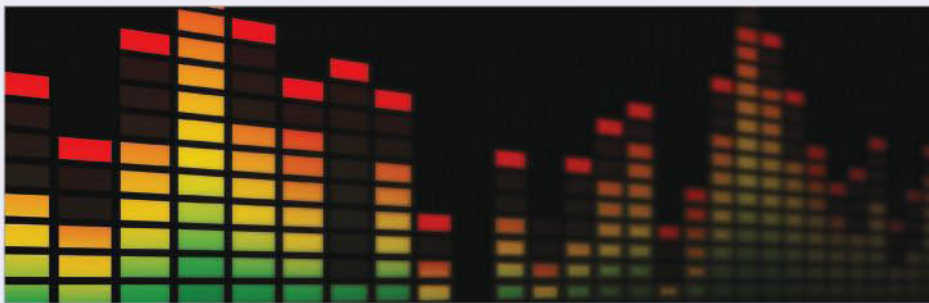
the installation image from the website (there are both 32-bit and 64-bit versions), write the image to a spare 2GB USB flash drive, and boot the laptop or desktop PC from it.

Since FreeNAS runs directly from the flash drive, all the disk space in the host PC is used for storage purposes. Make sure the PC is connected to your home network, direct your browser towards the device's web address, and use FreeNAS' simple web interface to complete the setup. Fill an old desktop PC with spare hard disks, and you can build up a secure, speedy NAS for peanuts.



▲ Create a NAS from an old PC by filling it with spare hard disks

BOOST THE QUALITY OF YOUR MUSIC LIBRARY



There isn't a magic wand you can wave to fix low-quality MP3s, but there are ways to spruce up a scratchy-sounding music collection. The most obvious – and time-consuming – method is to simply re-rip your CDs at a higher quality. If your old CDs are scratched, that's potentially fixable – applications such as Exact Audio Copy (www.exactaudiocopy.de) or dBpoweramp (www.dbpoweramp.com) both have the ability to scan scratched discs to try to recover the errors. This

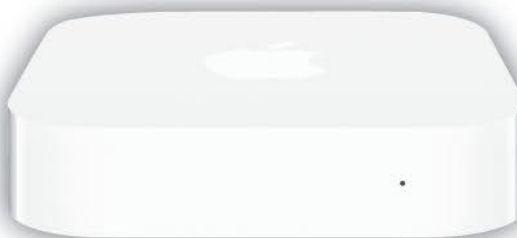
may take hours per disc, but it works.

Another, slightly cheeky, method is to sign up for Amazon's Cloud Player. The free service allows you to upload only 250 tracks for free, but if these tracks are in Amazon's library, you'll find your low-quality MP3s replaced by high-quality variable bit-rate MP3 versions, which you can stream online, or download to your PC with Amazon's MP3 Downloader software. Apple's iTunes Match does likewise for \$35 per year.

RIP OUT HOME CABLES

Wish you could play music from your smartphone on your Hi-Fi without rummaging around for a cable? While newer Hi-Fi systems and components are beginning to embrace wireless music, it doesn't cost much to add wireless audio streaming to even the most vintage of systems.

If you want to beam music to your Hi-Fi from any Bluetooth-enabled device, then Harman Kardon's BTA 10 (www.harmankardon.com) serves up wireless audio streaming for \$80. Simply plug it into any Hi-Fi with a spare audio input, connect to it with your smartphone or tablet, and you can stream local music tracks, or music from



online streaming services such as Spotify, Google Play Music or SoundCloud without getting up from your armchair.

If you have more than messy audio cables on your mind, then Apple's AirPort Express (<http://tinyurl.com/lllwjnr>) is an even more flexible option. This \$120 device allows you to slash a sea of cables by extending a dual-band 802.11n network and sharing USB printers over the network. It also provides a combined analogue and digital audio output for high-quality audio streaming.

CLEAN YOUR KEYBOARD, MOUSE AND MONITOR



Don't chuck a grubby old mouse or keyboard in the bin: it's easy to restore your peripherals to their former glory. Mice are generally the easiest to clean: after wiping the surfaces with a slightly damp cloth, a toothpick or similar is perfect for removing the trickier-to-reach grime.

Keyboards are even better at trapping dirt and dust. A quick shake over a bin will remove the worst, followed by a wipe with a damp cloth, and working the trickier bits out with a toothpick can work wonders. For the grubbiness of devices, we'd recommend using a can of compressed air to blast out dirt.

In the worst cases, such as sugary drink spillages, you may have to resort to removing the keycaps, or even running the keyboard through a detergent-free dishwasher rinse cycle. Not all will survive this, and you'll need to leave the keyboard to dry for several days.

Monitors deserve a lot more respect: only use a very slightly damp cloth if you have to, and only use dedicated screen cleaning liquids. The best bet is to use a microfibre cloth or a glasses cleaning cloth, and to gently rub away dirt with a light circular motion.

On the road again...

WHEN YOUR DATA IS SPREAD ACROSS PCS, MOBILE DEVICES AND THE INTERNET, BACKING IT ALL UP BECOMES A CHALLENGE. **ADAM TURNER** REVEALS THE BEST WAYS TO KEEP YOUR DATA SAFE, NO MATTER WHERE YOU STORE IT



Rather than leave your entertainment library locked up at home, your favourite movies and music can follow you as you walk out the front door.

With the boom in handheld devices we've come to expect the world at our fingertips. Streaming content around your home is simple enough, but things become a little more complicated once you're on the road. Thanks to the internet it's not necessary to cram every media file you own onto your smartphone or tablet, but relying on mobile broadband can get expensive. You should look to a combination of online and offline content in order to best meet your entertainment needs while you're out and about - whether you're crossing town on a bus or crossing the ocean on

a long-haul flight.

Under Australia's hotch-potch copyright laws it's legal to rip your music CDs to your computer and mobile devices, but not your movies from DVD or Blu-ray. That could change with this year's copyright law review, but it's unlikely. Of course it was against the law to rip CDs for many years, yet lawmakers looked the other way. Considering this, you can't really blame people for flouting the law and ripping movies they own.

If you don't want to rip your disc collection there are plenty of other ways to enjoy your favourite albums, movies and TV shows on your mobile devices. You can even watch live TV - the courts thwarted some services but there's more than one way to tap into live broadcasts on the go.



LOOK IN THE BOX

Next time you buy a movie on DVD or Blu-ray, it might come with a mobile-friendly copy. Unfortunately these versions tend to cost extra, if you can find them at all, and you never quite know what kind of digital download you'll get.

Digital Copy has been the de facto standard for the last few years. Some movies come with a separate video file on disc for copying to your computer, which you can watch in iTunes or Windows Media Player - but not both. Other movies include a code to download a mobile-friendly copy. From here you can also transfer the movie to compatible iTunes or Microsoft PlaysForSure portable devices.

Of course the Digital Copy system leaves Android users out in the cold. You can try connecting your Android device to Windows as an MTP (Media/ Picture Transfer Protocol) device and syncing your movie using Windows Media Player, but it's unlikely to work with DRM-protected Digital Copy WMV files. If you sideload the movie file onto your device it won't play due to the DRM. Once you've tried to do the right thing, your best bet is to download

software designed to strip the Digital Rights Management from the iTunes M4V or Windows WMV file, or just rip the disc yourself.

You'll occasionally find Pocket Blu-compatible discs, offering a copy for Apple or Android devices. You'll even come across discs with PlayStation Network download codes. It really is pot luck when you're wandering the aisles of your local movie store.

This year some movie houses started shifting to the new UltraViolet standard, starting with *The Hobbit*. To redeem an UltraViolet download you need to create an UltraViolet account and sign up with a partner such as EzyFlix, JB Hi-Fi or Flixtter. The first two support Windows, Mac, iOS and Android - making UltraViolet more of a cross-platform solution than Digital Copy. BlackBerry users should look to the Flixtter app, although the Windows Phone 8 version is still waiting for UltraViolet support. Eventually UltraViolet apps might also come to Smart TVs and other home entertainment gear.

The advantage of UltraViolet is that you've the choice of downloading your

movie to your device, so you can watch it offline, or streaming the movie straight from the cloud. The downside to UltraViolet is that you can't transfer downloaded movie files between devices as you can with iTunes. So if you want to copy *The Hobbit* to your computer, your Samsung Galaxy Tab and your iPhone then you need to download the movie three times. If you delete the movie from your iPhone to make space, you'll need to download it again to get it back on your phone. You can't watch UltraViolet movies on an Apple TV, and some iOS UltraViolet apps disable AirPlay video streaming.

UltraViolet's backers are working to make it more user-friendly, but for now the ecosystem is unlikely to impress iGadget users. Unfortunately you can't pick and choose your movies; if you want your bonus digital copy of *The Hobbit* you're stuck with UltraViolet (unless you rip the disc yourself).

Apple and Disney are the only major players refusing to back UltraViolet, with Disney switching to "Digital Copy Plus" in Australia as of *Iron Man 3*. This gives you the choice of redeeming your digital download from Apple's iTunes store, Google's Play store or from EzyFlix for



Windows, Mac, iOS and Android playback.

In the US, Vudu lets you pay a few dollars to download an UltraViolet copy of a DVD or Blu-ray you already own, but we're still waiting for this kind of service to reach Australia.

ON THE SIDE

If you've sourced your video files elsewhere there are several ways to get them onboard before you head out the door.

Most Android devices show up as USB storage when connected to your computer so you can drag and drop your video files. Some Android devices are also blessed with a micro-SD card slot, USB On The Go capabilities for

Movies ripped using HandBrake as .M4V files, so they're iOS-compatible, will play within the Google Drive, Microsoft SkyDrive and Dropbox apps. Of course it's fairly basic. You can pause a clip but if you close it you can't pick up watching where you left off later. As for formats like DivX, MKV and WMV, SkyDrive will leave you in the lurch but the others will cope.

It's a similar story on Android with Google Drive and Dropbox, except Google Drive balked at our WMV file and insisted on handing it over to a media player app. SkyDrive insisted on handing over every video file to a media player app, except for our MKV file which it declared no apps could play.

"The downside to Ultraviolet is that you can't transfer downloads between devices"

reading USB sticks, or even a full-sized USB host port. Look in the Google Play store for the Astro file manager, which makes it easier to navigate your way around the Android file system. If you're not happy with Android's built-in media player apps, take a look at MX Player, RealPlayer and RockPlayer.

iGadget owners can only sync Apple-friendly video formats via iTunes, but you can drop other video files straight into some apps. Plug your Apple device into iTunes and go to the Apps tab where you can drag video files into apps such as 8player and VLC, which can play non-Apple files.

STRAIGHT FROM YOUR CLOUD

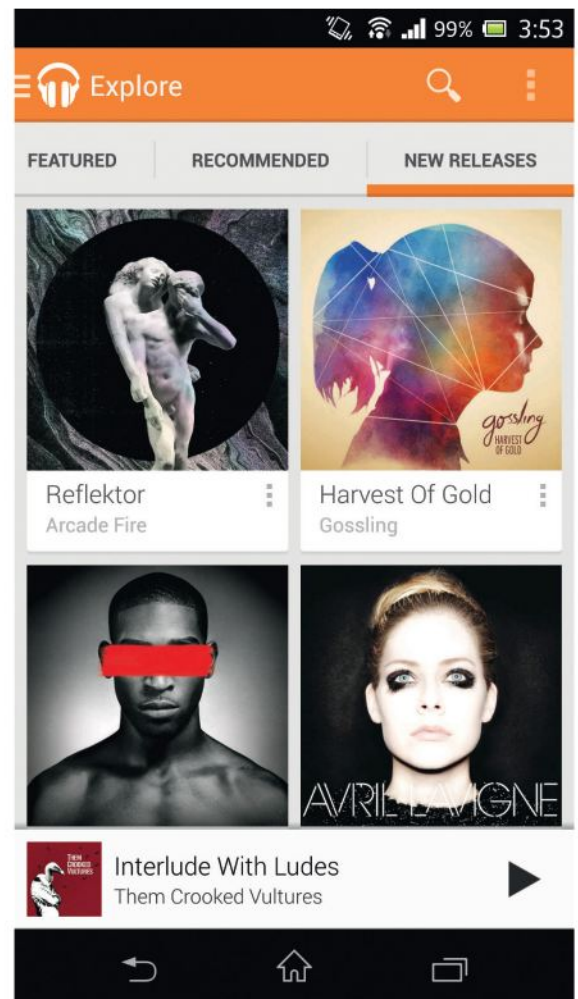
Many video files will play on mobile devices directly from cloud storage services, streaming on the fly without the need to download the entire file first.

ENTERTAINMENT ON DEMAND

While your own cloud storage offers a handy streaming workaround, if you've got a generous mobile broadband allowance you can tap into a wealth of online music and movie libraries.

Australians are spoiled for choice when it comes to subscription music services, although you usually need to pay extra for access from mobile devices. If you want to tap into a vast library of albums then your options include Rdio, Spotify, MOG (unmetered for Telstra mobile customers), Songl, Deezer, Guvera, Rara, Google Play's Music service, and JB Hi-Fi Now. If you're happy to simply listen to radio stations or a mix of your favourite artists then you should also consider Pandora, TuneIn, Stitcher and Live365.

Along with all these options you've got a range of vendor-backed music services such as Google Play Music



▲ Google Play Music

All Access, Nokia Music, Sony Music Unlimited, Samsung Music Hub and Xbox Music. Apple is the odd one out here - it doesn't offer a Spotify-style subscription music service, but you can use iTunes Match to listen to songs you already own. The new iTunes Radio lets you listen to genre-focused stations, but you can't listen to albums from start to end. If you're worried about maxing out your mobile broadband allowance, some apps such as Rdio and Spotify support offline album caching.

Of course you're going to chew through your mobile data allowance much faster when it comes to movies. The handset makers offer their own movie services - like iTunes, Google Play and Xbox Video - plus you can tap into others like Quickflix, Crackle and YouTube. You'll also find Bigpond Movies on Android. If you bluff your way into foreign app stores and run a VPN on your device you can enjoy US services like Netflix, Hulu, Vudu and Amazon Instant Video.

Life is easier for Apple users, as Android video apps are sometimes locked away in vendor-specific deals,



◀ MX Player for Android

like Samsung's exclusive Quickflix app. Meanwhile, apps like BigPond Movies don't run on some Samsung devices. You could experiment with sideloading apps to get around these restrictions but, as with most workarounds, the results are hit and miss.

If you're hiring a movie from iTunes on your iGadget, or watching a movie you've previously purchased from the iTunes store but isn't stored on your device, you can't start watching it until it's finished downloading. This means you have to wait, plus you need enough free space to hold the entire movie. The Google Play store is more flexible, letting you stream movies you've hired/purchased or download them first for offline playback.

You'll find plenty of apps for storing YouTube clips to watch offline, but the Quickflix and Crackle apps don't

SBS On Demand - which support AirPlay video streaming - along with Seven's Plus7 and Ten's Tenplay. Unfortunately Nine's Jump In is more of a companion app with video snippets.

Foxtel subscribers should also look to the Foxtel Go app offering live channels and Catch Up TV. Even if you don't have a home Foxtel service you can sign up for Foxtel Play, and there is also the Mobile Foxtel from Telstra app which offers live channels.

Meanwhile Android users have to wait in line for such apps, especially now that Flash support for Android has been dropped. Seven's Plus7 is no longer a Samsung exclusive but the SBS and Foxtel Go apps are still restricted to Samsung app store. Android versions of Tenplay and Jump In are reportedly in the pipeline, while



or Smart TV-based access to iPlayer, there's just the iOS app.

Of course there's also a BBC iPlayer app for the UK. It offers a wealth of free content, with offline video caching, but you'll need to sneak into the UK apps store and then run a VPN on your mobile device. If you're open to the idea of bypassing geo-blocking then you'll also find plenty of TV shows on US services like Netflix and Hulu. Others worth checking out include NBC, PBS and AT&T U-verse Live TV. HBO GO and Showtime Anywhere require a US home cable subscription. You'll find some of these apps for Android but once again it's hit and miss as to whether they'll run on your device.

“Google Play lets you stream movies you’ve hired/purchased or download them for playback”

support offline caching. You'll have more luck with offline video caching in US apps such as Amazon Instant Video and Vudu.

CATCH ME IF YOU CAN

Thankfully Australia's Catch Up TV outlook is much brighter, with all five major free-to-air networks and Foxtel offering mobile apps for watching your favourite shows on the run.

Once again Apple users get a better deal, with access to ABC's iView and

you can look to Aview as an unofficial substitute for iView. Whatever your Android device, there's no guarantee that any these apps are compatible.

The surprise entrant in Australia's Catch Up TV scene is the BBC's global iPlayer for iOS, a subscription service which offers a handful of free shows. There's AirPlay video streaming support and, as an added bonus, you can even cache content for offline playback. Unlike Australia's other Catch Up services there's no browser

TV ON THE RUN

A legal challenge from Telstra and the AFL/NRL killed off Optus' TVNow service, which offered a PVR in the cloud. The review of Australia's copyright law might reverse this decision, also benefiting similar services such as MyTVR, but for now there are other ways to watch television on your handheld gadgets.

Around your home you can use the



▲ Elgato eyeTV micro



Elgato EyeTV Netstream as a central TV tuner, letting you watch live free-to-air digital TV on your computers and handheld gadgets. The Humax 7500T and Strong 6500 PVRs can also stream recordings to mobile devices, plus the Strong 6500 lets you watch live TV remotely.

Once you walk out the front door, Elgato's Tivizen acts as a portable TV tuner for iGadgets, while Elgato's EyeTV Micro supports Android. They let you pause and rewind live broadcasts but you can't record. Another drawback is that you can't watch high-definition channels. Other Android options include the Elecom Mobile TV Tuner and TeVii T810.

The benefit of using a TV tuner is that you're not chewing through your mobile broadband allowance, although

you are now at the mercy of your television reception. If you can spare the bandwidth you'll also find IPTV simulcasts of live television, especially money-makers like sport. Foxtel Go and the Mobile Foxtel from Telstra app offer live Foxtel channels.

AFL and NRL fans will find Telstra LIVE apps for iOS and Android. They are subscription services but, unlike Foxtel, you've the option to pay for a single match. Vodafone's Cricket Live app has provided a simulcast for the last few seasons but Cricket Australia is looking for a new sponsor this year. Meanwhile Foxtel subscribers will also find Fox Sports apps for Android and iOS covering the likes of cricket, NRL, A-League and English Premiere League.

THE COMFORTS OF HOME

Rather than relying on the cloud it's also easy to stream your home media

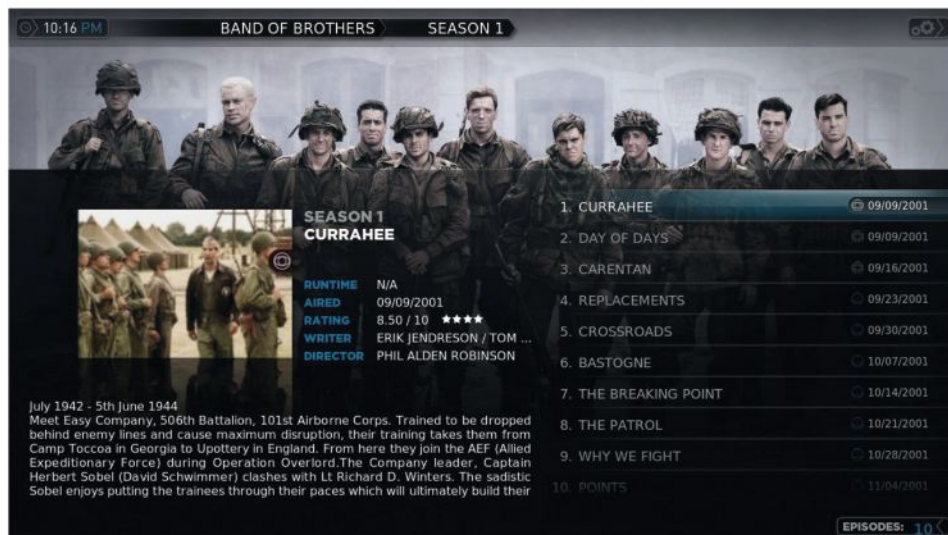
library across the internet to your handheld gadgets.

Plex is a great starting point, as you'll find media server software for Windows, Mac, Linux and Network Attached Storage drives from the likes of Netgear, Synology and QNAP. You'll also find a wide range of mobile apps which let you access your Plex media server from around your home or across the internet via a myPlex account. Paying for a PlexPass subscription adds extra features like the ability to download files for offline playback.

Other home media server applications which support streaming across the web include Air Video, ZumoCast and Orb. If you're streaming from home remember that you're chewing through your home data allowance if your home ISP counts uploads towards your monthly limit.

A Slingbox set-top box takes a slightly different approach, sitting in between your television and your AV gear so it can stream the video output from any AV device across the internet to your mobile devices. The Slingbox is even an IR transmitter, so it can change the channel on your PVR and do everything else you could do from the couch with the remote control. You can also stream from one Slingbox to another, making it a handy way to watch foreign television if an overseas friend is prepared to host a Slingbox in their home.

IceTV's upcoming PVR also promises to include Slingbox-style features, initially streaming recordings around your home but eventually streaming over the internet as well. Australia's television networks won't like it, but the fact you're streaming from your own PVR means you should fall within copyright law. ■

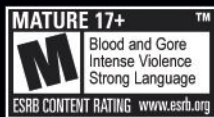


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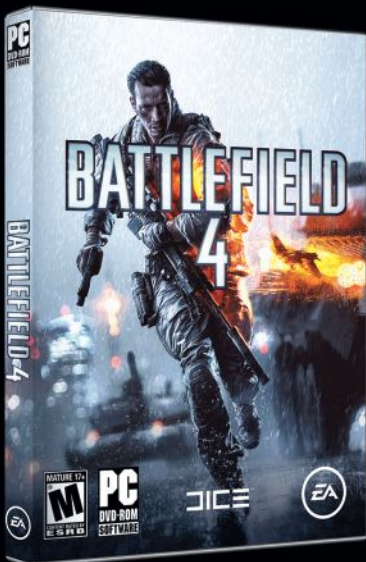
*Requires 4K display and content. Supported resolution varies by GPU model and board design; confirm specifications with manufacturer before purchase.

*AMD TrueAudio technology is offered by select AMD Radeon™ R9 and R7 200 Series GPUs and is designed to improve acoustic realism. Requires enabled game or application. Not all audio equipment supports all audio effects; additional audio equipment may be required for some audio effects. Not all products feature all technologies – check with your component or system manufacturer for specific capabilities.

*Application support for Mantle is required.

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WINDOWS VS OS X: *WHICH IS FASTER?*



WINDOWS AND OS X EACH HAVE THEIR SUPPORTERS, BUT WHICH WILL MAKE YOUR APPLICATIONS RUN AT FULL SPEED? **DARIEN GRAHAM-SMITH** FINDS OUT

Apple hardware is everywhere, and if you don't already own a Mac, you may well be considering one for your next PC. In our reviews, the MacBook Pro 13in with Retina display (see p43), 27in iMac and MacBook Air received Recommended awards. Even in business, Mac desktops have become a viable choice (apart from their higher pricetag compared to Windows competitors), thanks partly to their ability to run both OS X and Windows, whether via a virtualisation package such as Parallels, or via Apple's Boot Camp dual-boot system.

But which system should you make your main operating system? OS X has the advantage of better security and better integration for things such as multitouch gestures and function keys, but Windows has its own strengths, including more games, wider hardware compatibility and broader support for legacy software.

One factor that's difficult to quantify is performance. OS X and Windows are based on different kernels, with distinct approaches to the likes of multitasking and virtual memory. What's more, while many mainstream applications are offered on both platforms, they'll necessarily be implemented in different ways, as dictated by the different platform architectures. As such, they perform the same jobs quite differently.

With that in mind, we set out with a stopwatch to time how long OS X and Windows took to complete a variety of common desktop tasks. Our mission was to find out whether Apple's native OS gives a performance advantage over Windows, or if it's actually slower.

To ensure our results were representative, we tested the OSes on the same hardware – a pair of mid-range Mac systems with relatively limited power, where performance could easily be a real-world issue. One

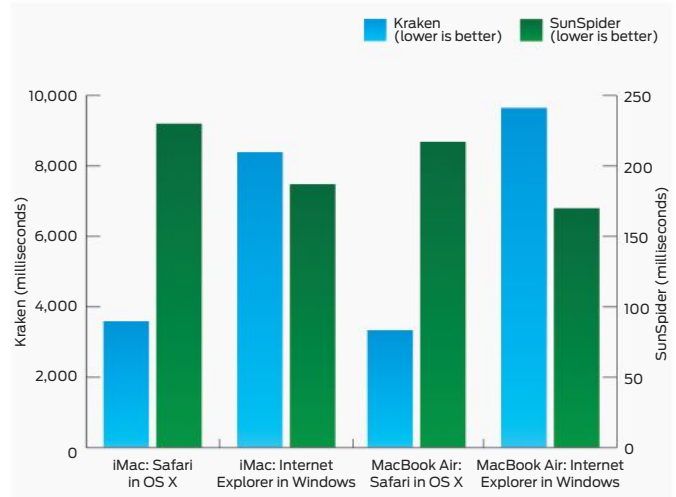
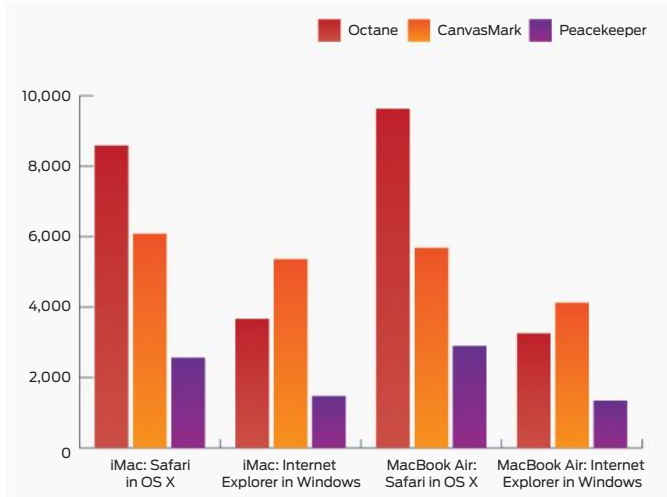
was a 2008 iMac with a 2.4GHz Core 2 Duo E8135 processor, 3GB of 667MHz DDR2 RAM and a 250GB Hitachi Deskstar P7K500 3.5in hard disk. The other was a 2011 MacBook Air, with a 1.6GHz Core i5-2467M processor, 4MB of 1333MHz DDR3 RAM and an Apple SM128C SSD.

“OS X and Windows are based on different kernels, with distinct approaches”

Both machines were set up as Boot Camp dual-boot systems. Since most Mac users keep their operating system current, we used the latest release of OS X 10.9, Mavericks; for Windows, we used the most popular version of the OS, namely Windows 7 Home Premium, running natively on the hardware.

Test 1: Browser performance

GRAPHS 1 AND 2: BUNDLED BROWSER PERFORMANCE



We started our tests by looking at web-browser performance. This is an important aspect of overall performance, since these days we use our browsers for everything from sending and receiving email and working on documents to watching movies and playing games.

To get an all-round picture, we tested each platform with five benchmarks. The SunSpider, Kraken and Octane tests focus on JavaScript performance, reflecting the general responsiveness of apps such as Gmail and Google Drive. The CanvasMark and Peacekeeper benchmarks assign more weight to the graphical and entertainment capabilities of HTML5, giving an indication of each platform's multimedia performance.

We first carried out these tests using the browser bundled with each OS – Safari 7 on OS X and Internet Explorer 10 on Windows 7. You can see our results in the graphs above, which detail the tests across both platforms on both platforms. Graph 1 shows scores from the Octane, CanvasMark and Peacekeeper benchmarks: these all return absolute scores, so taller bars show better performance. The Kraken and SunSpider benchmarks – shown in graph 2 on the right – return results in milliseconds, so here a lower score is better.

Overall, we found Safari on OS X took the lead. On our iMac, across all benchmarks, Safari proved 67% faster on average than Internet Explorer on Windows. On the MacBook Air, Safari was around twice as fast overall.

We saw one glaring anomaly: Microsoft's browser pulled far ahead of Safari in the SunSpider test. We suggest you don't attach too much significance to this, however: when you consider IE's laggardly scores in the other benchmarks, it looks as though the browser has been specifically optimised for this benchmark. We expect real-world performance will be closer to what we've seen in the

“Your choice of OS makes much less difference than your choice of browser”

Kraken and Octane tests.

Clearly, if you're planning to stick to the OS developer's own browser, Safari on OS X is the way to go, but it's worth remembering that these native browsers aren't your only options. One popular alternative is Google Chrome, which is offered for both OS X and Windows. When we repeated our tests using the latest build of Google Chrome (version 29) on both systems, we saw OS X's apparent advantage completely erased. In fact, Apple's platform was left slightly behind overall – the iMac trailed across our tests by an average of 8%, the MacBook Air by around 1%. This is probably a small enough margin to live with, but the upshot is clear: when it comes to online performance, your choice of OS makes much less difference than your choice of browser.



◀ The Peacekeeper benchmark tests the gaming capabilities of web browsers

Test 2: Office applications

For our next set of tests, we turned to two of the most widely used applications in the world – Microsoft Word and Microsoft Excel. Microsoft publishes OS X editions of these programs as part of the Office for Mac suite, but they have different interfaces. Also, while Windows users are on Office 2013, the latest Mac suite is the 2011 edition.

This being the case, we expected to see some palpable differences in the user experience across the two platforms. Basic tasks such as typing, printing, opening files and calculating sums happened so smoothly in both operating systems that we couldn't detect any difference. But larger tasks, such as big find-and-replace jobs and drawing graphs, make differing levels of performance noticeable.

We started by opening a large document in Word – the full text of Lewis Carroll's *Alice's Adventures in Wonderland*, to be precise – and timed how long it took the software to replace every letter "I" with the word "TEST". This isn't exactly a real-world exercise, but it's an indicator of overall performance.

Then, we pumped up the font size to 32 points and timed how long it took for Word to repaginate the document. In Word 2013 on Windows, this stretched it from 43 pages to 587 pages, while in Word for Mac 2011, owing to differences in the default formatting, the document ran to 683 pages. Our results, in seconds, can be seen in graph 4, below.

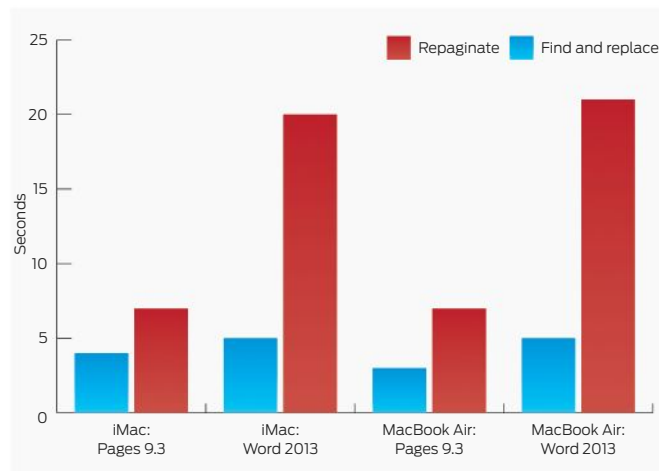
Clearly, Word for OS X is slower than Word for Windows. On the MacBook Air, the difference wasn't too alarming – as a proportion, eight seconds is much

longer than five seconds for a find-and-replace operation, but our test used a deliberately extreme usage case. In real-world use, the difference is likely to be negligible. On the iMac, however, Word 2011 for Mac lagged by a greater margin, especially in the repagination task.

As with our browser test, Word isn't your only choice. If you're using a Mac for work, you might prefer to use a Microsoft-branded office suite. But for many Mac users, Apple's own iWork suite – comprising Pages, Numbers and Keynote – provides sufficient power. It's cheaper, too, working out at \$63 for the three applications, versus \$170 for Microsoft's Office for Mac Home & Student edition. A more appropriate comparison might be Word 2013 versus Pages 9.3. The results of that test are shown in graph 3, above. As you can see, the situation is flipped: Microsoft Word is quicker on Windows than on a Mac, but Pages on OS X delivers the best performance on any platform.

We also compared performance in Excel. Again, we started by testing the latest versions, pitting Excel 2013 on Windows against Excel 2011 on OS X. This time, the test was to render a stacked 3D bar graph representing four series of 1000 random numbers. Here, we saw no effective difference between versions, so we moved on to compare Excel on Windows with Apple's Numbers on OS X. Since its charting

GRAPH 3: NATIVE WORD-PROCESSING SOFTWARE PERFORMANCE

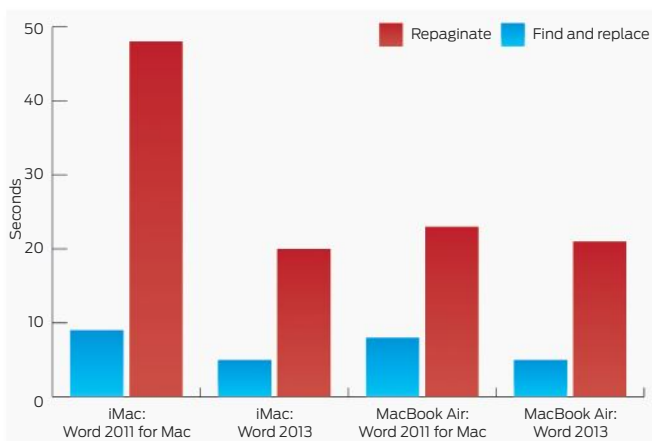


options don't precisely match those of Excel, our approach doesn't allow a perfect comparison of performance.

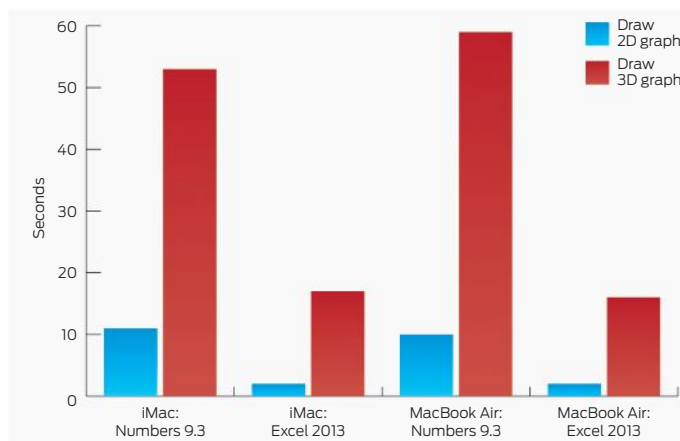
However, we can compare how long it takes Excel and Pages to render stacked bar graphs in their respective default 2D and 3D forms, which gives us an idea of how long a typical user will spend waiting for their graph to draw or update. The results – shown on graph 5, below – are the opposite of what we saw with Pages.

For journalists and authors (and other word-heavy professions), the blazing responsiveness of Pages makes OS X and iWork an attractive pairing, with Microsoft Office on Windows taking second place. If you work heavily with figures, the situation is reversed, thanks to Numbers' slower handling of graphs.

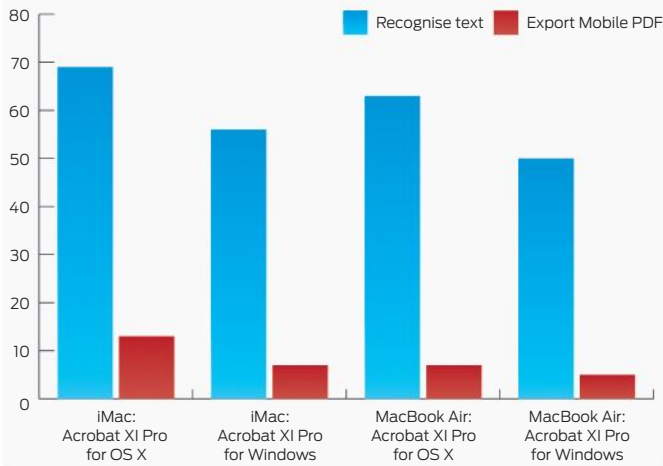
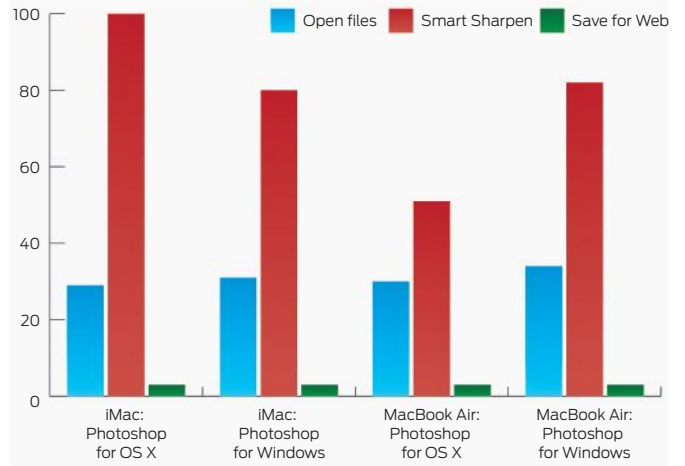
GRAPH 4: MICROSOFT WORD PERFORMANCE



GRAPH 5: NATIVE SPREADSHEET SOFTWARE PERFORMANCE



Test 3: Adobe Acrobat and Photoshop

GRAPH 6: ADOBE ACROBAT XI PRO PERFORMANCE

GRAPH 7: PHOTOSHOP PERFORMANCE


Ever since the dawn of desktop publishing, creatives have tended to gravitate towards the Mac. But industry-standard applications for designers and multimedia producers have long been available for Windows, too. Might creative software run better on Windows?

To find out, we started with a few tasks that will be familiar to many print professionals: we loaded a 20-page PDF into Adobe Acrobat, carried out text recognition, then exported it using Adobe's "Mobile" optimisations. We did this using Acrobat XI Pro on OS X and Windows - this being the version currently offered as part of Adobe's Creative Cloud service - and timed each operation.

Although the software is supposedly exactly the same on both platforms, OS X was consistently slower than Windows (see graph 6, above). The difference was a matter of seconds in this case, but applying such operations to multi-chapter publications full of hi-res photographs can take minutes or more. The cumulative time lost could cost a busy agency serious money.

Finally, we turned to arguably the most widely-used creative tool in the world - Adobe Photoshop. Again, we used the latest version - Photoshop CC - and timed a series of actions. First, we opened three 24-megapixel raw images via the Camera Raw importer. Then, we applied a 100% Smart Sharpen filter to one, with a 1-pixel radius and 10%

noise reduction. We used the "Save for web" module to shrink it and export it as a medium-quality JPEG.

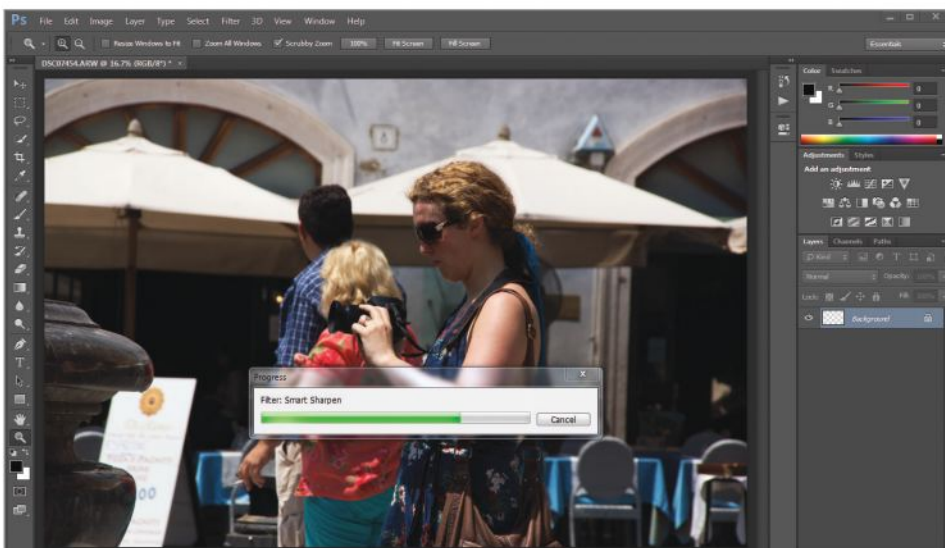
On the iMac, our number-crunching tasks were around 20% slower in OS X than in Windows (see graph 7, above) - an outcome fairly consistent with what we saw in Acrobat. On the MacBook Air, however, OS X managed to open the files more quickly than Windows, and raced ahead by 30 seconds when it came to Smart Sharpening. Evidently, the MacBook Air hardware allows Photoshop on OS X to take a clever shortcut that isn't available in Windows, nor on the older iMac. ■

The Winner

Our results are a mixed bag. In some cases, such as Google Chrome testing, we've seen almost identical performance across Windows and OS X. Elsewhere, Acrobat XI Pro and Word 2013 for Windows made Apple's platform appear slow. However, if you bring in a native application, the Mac looks good again.

Sadly, you can't point to one platform and say "this one is faster". Even though OS X and Windows run on similar hardware, performance can be different, even in areas where you might expect the platforms to be in lockstep.

For the best computing experience, you can't follow one brand. However, our results give you an idea of the strengths of some of the most widely used applications, and if you weigh this information into your buying decision, you'll end up with the best tool for your job.



▲ Real-world performance varies in Adobe Creative Cloud, depending on the operating system

IN THE LABS

YOU WON'T FIND
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IN AUSTRALIA!

Why so white?

DAVID HOLLINGWORTH PONDERES THE SAD,
INEVITABLE FUTURE OF WHITE PERIPHERALS AND COMPUTING GEAR...

When John unboxed SteelSeries' latest set of gaming headphones, my response was pretty much instant, and straight from my gut.

"No. No-no-no. Nope. Please, God, why? Just... Nope-nope-nope," I think, was what I said.

For some reason we've lucked onto a lot of white goods this issue, and I don't mean washing machines. We've got a white case, and two sets of white headphones. The case is bad enough – these are a high-touch environment, and as I point out in my review, if you like the look of it, be prepared to spend a lot of time cleaning it. But it's doable.

Sennheiser's white cans I can just about get my head around (or, more accurately, around my head), but the Steelseries ones?

Part of it is the design, which just seems ludicrously excessive. Massively padded ear-cups are real overkill, and while they do isolate sound very well, they're hot, and look, well... gosh, I wouldn't be caught dead in those in public.

However, the worst aspect of it is just how terrible those white earcups are going to look after just a bit of use.

White leather in an Australian summer, with the heat-source of an overclocked PC nearby? Wow. Between sweat, possibly dandruff, and general grime – and if you also don't keep your ears clean – I just cannot imagine how bad these might look after just a couple of months of constant use.

It reminds me of one of the rare EPIC FAIL awards we gave out back in the pages of Atomic, for a Razer keyboard with a mirror-like finish. After just five minutes of use it ended up covered in, well, grease. Most keyboards are, but the mirrored surface made everything look about a billion times worse. After a bit of use you were scared to touch it, and horrified at your own filth.

It was not a good look – and Razer even agreed with us, bless 'em.

But it's an important point for any gear that's going to spend a lot of time making contact with your skin: make sure it's not going to look terrible the minute you touch it!

DAVID HOLLINGWORTH

is our Managing Editor. In between reviewing games and hardware, he looks after *PC & Tech Authority's* website and social feeds.



WHAT OUR A-LIST MEANS

Our A-List award is reserved for the best products in each category we review. With a winner and an alternative pick in each, that's 92 products you know are first class.



WHAT OUR AWARDS MEAN

PC & Tech Authority's comprehensive Real World testing sorts out the best products from the pack. Any product recommended by PC & Tech Authority is well above average for features, value for money and performance.



WHAT OUR RATINGS MEAN



OUTSTANDING
VERY GOOD
GOOD
ORDINARY
POOR
VERY POOR

HOW WE TEST



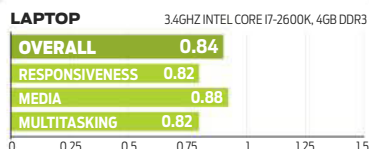
OUR BENCHMARKING TESTS ARE THE BEST IN THE BUSINESS. READ ON TO FIND HOW THEY WORK...

2D TESTS

We test desktop PCs, netbooks and laptops with our own, custom-built, 2011 Real World Benchmarks.

We split the results into three categories: Responsiveness, Media and Multitasking, with the Overall score an average of the three sub-scores.

For instance, responsiveness replicates light browser and productivity workloads. The Media test involves running iTunes for audio conversion, Photoshop CSS to crunch large images and Sony Vegas 10 to edit home video. This then gets run simultaneously alongside Cinebench 11 in order to get a handle on the multitasking ability of the system.



3D TESTS

We use pre-recorded demos in Crysis and DIRT 3 to test gaming performance where relevant. We have three standard test settings, depending on the power of the graphics card: Low, Medium and High.

To test gaming performance, we use our own recorded Crysis benchmark. We use the Low, Medium and High quality settings in 1366 x 768, 1600 x 900 and 1920 x 1080 screen modes respectively. Very high-end systems can also be tested using the ultra-intensive Very High settings, with all detail switched on, and varying levels of anti-aliasing enabled.



LAPTOP BATTERY LIFE

We subject laptops to two battery tests. In the light-use test, we optimise the system settings for the greatest power efficiency. We then disconnect the mains and run a script scrolling a selection of web pages until the system shuts down, giving you a realistic idea of the surfing time each laptop offers.

For the heavy-use test, we engage Windows' High Performance power profile, set the display brightness to maximum, and allow the taxing Cinebench 3D renderer to push the processor load to the limit. This gives a worst-case figure, revealing how long you can expect the battery to last under the most demanding conditions.



GROUP TEST COMPACT CAMERAS 58



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Photography, Julian Velasquez, repro, Jan Chhak



MICROSOFT SURFACE PRO 2 AND SURFACE 2

POWERFUL AND DESIRABLE WITH GREAT BATTERY LIFE – MICROSOFT GETS THE HYBRID TABLET FORMULA RIGHT AT THE SECOND ATTEMPT

PRICE \$1129 (Pro 128GB); \$529 (32GB)
SUPPLIER www.microsoft.com

With unsold stock of the original Surface RT burning a billion-dollar hole in Microsoft's finances, the company needs to make amends.

Enter the new Surface Pro 2 and Surface 2 models, which boost the specifications, extend battery life and give Microsoft a fighting chance of avoiding another expensive write-down.

While the two first-generation Surface models were peas in a pod physically, they've now gone their separate ways. Both new models are fitted with a dual-position kickstand, addressing one of our chief complaints with the original, fixed-position models, which were too upright to use

comfortably on your lap. However, this is where the similarities end.

The Surface Pro 2 – the full-fat tablet running Windows 8.1 – has an almost identical build to its predecessor; only a new Surface logo on the rear distinguishes it from the original Surface Pro. As such, it remains a lightweight pseudo-laptop when used with a keyboard (see Keyboards and dock, p41), but a hefty, 920g device to hold in the hand as a tablet.

The ARM-based Surface 2, on the other hand, has been redesigned – note that the contaminated RT brand has been sidelined by Microsoft – and is marginally slimmer and lighter than its predecessor. It weighs 654g – almost 200g more than Apple's iPad Air – and sports a silver livery, distinguishing it from the gun-metal black of the Pro.

SURFACE PRO 2

1.6GHz Intel Core i5-4200U • 4GB RAM • 128GB storage • Windows 8.1 Pro • 10.6in 1920 x 1080 IPS display • 802.11bgn Wi-Fi • Bluetooth 4 • 1 x USB 3 • MicroSDXC slot • mini-DisplayPort • 275 x 173 x 13.5mm (WDH) • 920g (without keyboard)

The big difference for the Surface 2 is the screen, which now matches the Pro's 10.1in Full HD resolution. It's a notable bump from the 1366 x 768 display on the Surface RT, and our colorimeter reported a stark contrast ratio of 899:1, a





▲ The Surface Pro 2 (top) is thicker than the Surface 2, but it boasts twice as much RAM and offers up to 256GB storage

healthy peak brightness of 414cd/m² and a near-perfect Delta E of 3.2. This confirms what one glance at either screen will tell you: the display is top-notch, with the primary colours of the Start screen tiles almost popping off the screen. In fact, no device we've come across makes the Windows 8.1 Start screen look more appealing. It's a shame that a few regular x86 desktop apps, such as Google Chrome and Adobe Photoshop, aren't optimised for high-DPI screens, since this makes text look blurry and icons and onscreen menus annoyingly small.

WHAT'S INSIDE?

Despite the Surface 2's exterior overhaul, it's what's inside that makes the difference to both tablets. The Surface Pro 2 packs a 1.6GHz Intel Core i5-4200U, which Turbo Boosts to 2.6GHz when required. However, its fourth-generation Haswell architecture does nothing to boost performance over its Ivy Bridge predecessor: an overall score of 0.61 in our Real World Benchmarks is actually marginally lower than that of the original.

It does, however, extend the battery life considerably. A full day's work was beyond the original Surface Pro, which managed only 5hrs 52mins in our light-use battery test. The Surface Pro 2 is built of sterner stuff: in the same test, it lasted for 9hrs 15mins, despite packing exactly the same 42Wh battery as its predecessor. This means it's likely to survive a working day away from the mains, unlike the original Pro, which would barely make it past lunchtime.

The Surface 2 also gets an upgrade – from a 1.3GHz quad-core Tegra 3 to a 1.7GHz quad-core Tegra 4. Here, you do feel a performance benefit. The general sluggishness in 3D games and dual-screen multitasking that beset the Surface RT has largely disappeared, which is impressive considering the Surface 2 is throwing more pixels around the screen than its predecessor.

Our Real World Benchmarks don't run under Windows RT, but the

SunSpider JavaScript test was completed in 390ms – more than twice as fast as the Surface RT and the fourth-gen iPad. Direct comparisons with Android and iOS devices are difficult, but this feels like the most powerful and responsive tablet we've handled. This doesn't come at the expense of battery life, either: the Surface 2 lasted 9hrs 45mins in our looping video test. Anecdotal, we got through around three days of fairly intensive use before we needed the charger.

We still have reservations about the 32GB capacity of the base Surface 2 model, but there are various options for storage expansion, including a microSD slot, a USB 3 port for external drives and 200GB of free SkyDrive storage for two years.

WINDOWS 8.1 AND RT

You can read our full opinion of Windows 8.1 on p52; for now, it's sufficient to say it makes the Windows Surface Pro 2 a far more joined-up, tablet-friendly experience than its predecessor. It's a free upgrade for owners of the original Surface Pro, too. Windows RT 8.1 is also much improved. The Windows app ecosystem is showing signs of maturity, with decent first-party apps from companies such as Facebook, Twitter and Netflix; this will make trips back to the desktop browser less of a necessity. The bundled desktop Office apps have also been rounded out with the addition of Outlook, so you no longer have to exit the desktop and open the Mail app to email a Word document.

There's still a disjunction between the desktop and Metro worlds – the Share charm is essentially useless on the desktop, for example – but it feels less compromised overall.

GROWN-UP TABLETS

Microsoft's Surface tablets are maturing nicely. Silly flaws remain – the magnetic charger is too fiddly, and it's plain daft that the

Keyboards & Dock

Touch Cover 2 (\$139.95)

Similar to last year's Touch Cover, only now backlit and boasting one or two fancy features, such as moving from word to word by swiping across its surface. The small touchpad is responsive, but it's still too difficult to achieve full touch-typing speed without "proper" keys.

Type Cover 2 (\$149.95)

This also benefits from a backlight, which comes on only when needed. The bigger improvement to Microsoft's laptop-like keyboard is the increased strength of the base; it's now possible to type on your lap without the entire keyboard flexing and some keys becoming inoperable.

Power Cover (TBC)

Due in early 2014, and only for the Surface Pro 2, the Power Cover is a Type Cover with an integrated second battery. This could almost double the longevity of the tablet, which means it may be worth postponing a purchase until this keyboard becomes available.

Docking Station (TBC)

The Surface Pro Docking Station, also not due until early next year, will offer one USB 3 socket, three USB 2 ports, mini-DisplayPort and Ethernet sockets, plus charging capability. It's likely to be a must-have for anyone contemplating using the Surface Pro 2 as their day-to-day office PC.

SURFACE 2

1.7GHz Nvidia Tegra 4 • 2GB RAM • 32GB storage • Windows RT 8.1 • 10.6in 1920 x 1080 IPS display • 802.11bgn Wi-Fi • Bluetooth 4 • 1 x USB 3 • MicroSDXC slot • mini-DisplayPort • 275 x 273 x 8.9mm (WDH) • 654g (without keyboard)

stylus (supplied with the Pro 2) can't be housed within the casing, instead clipping awkwardly onto the charger port – but these are minor quibbles about two exceptional pieces of hardware.

All in all, the updated Surface range offers a balance that's fit for business and play. With its revamped selection of keyboards and docks, the inclusion of a year's worth of free Skype telephone calls, bundled Office apps (for the Surface 2) and a generous helping of SkyDrive storage, Microsoft's platform is stronger than ever. It's supported by an increasingly sophisticated selection of built-in and third-party apps, too.

Neither Surface is the best tablet on the market; neither is the best laptop. They are, however, the best hybrid packages out there for people who can't afford, or don't want, both.

Barry Collins

SURFACE PRO 2

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

OVERALL ★★★★★☆☆

SURFACE 2

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

OVERALL ★★★★★☆☆

► Both hybrids are fitted with a dual-position kickstand that makes them more flexible

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APPLE MACBOOK PRO 13IN WITH RETINA DISPLAY

SUBTLE TWEAKS MAKE A BIG IMPACT – WITH A LIGHTNING-FAST SSD AND HASWELL CPU, APPLE HAS A WINNER ON ITS HANDS

PRICE \$2199
SUPPLIER www.apple.com.au

While all eyes were on the new iPads at Apple's autumn keynote, the company also revealed an update to its 13in and 15in MacBook Pro with Retina display models. It heralded the arrival of Intel's Haswell CPUs, but the big surprise was the price cut, which saw the entry-level MacBook Pro 13in with Retina display tumble to \$1599.

The price isn't the only thing that's smaller: the MacBook Pro's weight has dropped from 1.63kg to 1.55kg. It's lost a millimetre around the waist, too, so it's now 18mm thick. The whole package, including the power supply, weighs 1.81kg.

Under the surface, Apple has rung the changes. Gone are the Ivy Bridge CPUs of old, replaced by a trio of Intel Haswell options: two Core i5 parts and a Core i7, the latter being an optional upgrade. There's also a range of new PCI Express SSD drives, with capacities in the preconfigured models rising from 128GB up to 512GB, with 1TB an optional extra.

The move to Haswell delivers a whole range of improvements. In our Real World Benchmarks, the improvements were slight: the previous Ivy Bridge model, with its 2.5GHz Core i5-3210M CPU, 8GB of RAM and 256GB SSD, scored 0.73 overall; our review model, equipped with a 2.6GHz Core i5-4288U CPU, 8GB of RAM and 512GB SSD, edged ahead with 0.76.

Subjectively, it's the new PCI Express SSD that brings the biggest boost. Whether you're working in OS X or

Windows 8 via Boot Camp, the MacBook Pro feels incredibly light on its feet. Applications bound into view, and boot times are swift. In Windows 8, it blitzed the AS SSD benchmark: it achieved sequential read and write speeds of 723MB/sec and 616MB/sec, well ahead of the fastest 2.5in desktop SSD we've reviewed, Samsung's 840 Pro.

The arrival of Intel's Iris Graphics 5100 chipset addresses one of our criticisms of the previous generation: it's much more at ease with the demands of the Retina display. Flicking through web pages is smooth and fluid, and gaming performance takes a step forward, too – an average frame rate of 32fps in our Crysis benchmark run at 1600 x 900 and Medium detail marks a 45% boost on the previous model, just don't expect to game at native resolution.

Intel's Haswell also boosts battery life. With the screen dimmed and Wi-Fi off, the MacBook lasted 11hrs 4mins in our light-use battery test, run under Windows 8 Pro 64-bit.

The MacBook Pro's Retina display still stomps all over the opposition. With a maximum brightness of 374cd/m² and a contrast ratio of 1069:1, the MacBook Pro's panel covers, and slightly exceeds, the sRGB colour gamut, and the average Delta E of 2.4 is top-notch by all but high-end monitor standards.

This is as good as laptop displays get, but the 2560 x 1600 resolution throws up minor issues. DPI scaling is essential to keep onscreen elements legible in OS X and Windows 8 alike, but with more apps adding Retina support in OS X, and Windows 8.1 delivering much-improved OS-wide scaling, it's no longer the concern it was.

Connectivity hasn't changed a great deal – there are still two USB 3 ports, twin Thunderbolt ports, HDMI and a full-sized SD card reader – but the addition of dual-band 802.11ac is welcome. It's almost enough for us to



▲ The Retina display is outstanding, and Intel's Haswell makes its mark



KEY SPECS

2.6GHz Core i5-4288U
• 8GB DDR3L RAM
• 512GB SSD • 13.3in
2560 x 1600 LCD
• Intel Iris Graphics 5100
• dual-band 802.11ac
Wi-Fi • Bluetooth 4
• 2 x Thunderbolt • 2 x
USB 3 • HDMI • 314 x
219 x 18mm (WDH) •
1.55kg (1.81kg with
charger)

forgive Apple's decision to abandon the Ethernet socket in last year's redesign.

It's incredibly tough to find fault with the new MacBook Pro. There's power aplenty, great battery life, a class-leading display and – thanks to Intel's Iris GPU – the graphics performance the Retina display always deserved. Gram for gram, we can't think of a laptop that delivers so much. The MacBook Pro 13in with Retina display is the best laptop money can buy.

Sasha Muller

3D SPEED

GOOD PLAYABLE UNPLAYABLE

HIGH SETTINGS	14FPS
MEDIUM SETTINGS	32FPS
LOW SETTINGS	58FPS

BENCHMARKS

3.4GHZ INTEL CORE I7-2600K, 4GB DDR3 = 1

OVERALL	0.76
RESPONSIVENESS	0.84
MEDIA	0.82
MULTITASKING	0.63

BATTERY LIFE

HOURS:MINUTES

HEAVY USE	2:17
LIGHT USE	11:04

PERFORMANCE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



VENOM BLACKBOOK 17

A MONSTER LAPTOP RETURNS WITH A NEW GENERATION OF HARDWARE UNDER THE HOOD

PRICE \$3999

SUPPLIER venomcomputers.com.au

Our first encounter with the Venom brand was with its Ivy Bridge-powered Blackbook 17, a beastly gaming/workstation machine that went straight to the top of the A-List. This model has now been updated to the latest in mobile hardware, along with some small changes to the chassis design, so we were eager to get it into the Labs and see what had changed.

This isn't the first time we have seen this design of laptop. The Blackbook 17 is based on the same chassis as Pioneer's Dreambook Power P17HW, but there have been some noticeable changes. Central to this is the removal of the somewhat pointless and aesthetically dubious 'ball with wings' lighting motif that seems to be a standard feature on the chassis. This has involved the replacement of the touchpad, and the model used on the Blackbook 17 not only looks but feels better under thumb than the stock one.

Small touches like these are what has impressed about the Venom lineup, especially considering that several manufacturers offer quite similar competing products. While corner cutting and shaving off dollars work at the low end of the market, our review model of Blackbook 17 goes for a retail price of \$3999, and when you are making that kind of commitment to a high-end performance laptop then you want this kind of attention to detail behind its build.

It isn't just the tweaked chassis that makes this a compelling product. Under the hood sits an impressive lineup of hardware, with an Intel Core i7-4700MQ CPU, 4GB GeForce GTX 780M GPU, 32GB of DDR3 and two 512GB Samsung SSDs running in striped RAID. It also has a Blu-ray burner, Dual Band 802.11n Wi-Fi and a gorgeous 1920x1080 screen.

As one would expect from this heady specification list, the Blackbook 17 is very much a laptop that one carries between power outlets. Not only is it a chunky slab

of rubberised soft touch plastic, but it weighs a touch over 4KG and comes with a hefty power brick. But, unlike the Gigabyte P35K (page 45), it makes no pretence of being a product to be used on the go, and we are okay with that.

This heft and power means that it sucks down the battery, however. We didn't even bother running our heavy-use battery test, after our light-use one saw the battery running dry after only two hours and six minutes. The trade-off for this lack of mobility is some serious power, however, with our real world benchmarks returning a result of 1.07, virtually the same as the Pioneer Dreambook P17HW. This is understandable, given the same base hardware, but the Blackbook 17 stands out in other areas – most noticeably in that intangible feel that comes from having dual SSDs for storage. While a total of 1TB of solid state memory may seem indulgent, we were surprised to see that this specification of Blackbook costs under \$200 more than the Dreambook, which had a 120GB SSD and 1TB 5400rpm HDD.

As one would expect from the GTX 780M, currently the fastest laptop GPU out there, gaming was excellent, with the Blackbook 17 delivering playable framerates at native resolution, with detail set to high. This is also where the screen comes into its own, delivering picture quality that makes a lot of standalone monitors look underwhelming. It is when gaming that all the pieces of the puzzle come together, and after a short while with the machine we wished we had \$4000 to drop on such a beast.

Ultimately it will be the pricetag that determines whether this



KEY SPECS

Intel Core i7-4700MQ • 4GB GeForce GTX 780M • 32GB DDR3 • 2 x 512GB SSD • dual band 802.11n • 1920x1080 matt LCD • Blu-ray Writer

is the right laptop for you. Make no bones about it, this is very much at the expensive end of the market, but at the same time you just can't get this level of performance and quality for less. Given that there aren't a massive number of options at this end of the market, choosing a standout product comes down to the little touches, especially when looking at a base chassis that is employed by several local system builders.

Once again Venom has gone that extra mile – from the SSDs to getting rid of the horrid glowy touchpad (seriously, when spending this much on a laptop we want it to avoid the tendency for gaming products to be garishly lit), it has taken a base design that was already impressive and brought it close to perfect, knocking its predecessor off the A-List and setting a new high bar for gaming laptops.

John Gillooly

3D SPEED

VERY HIGH SETTINGS	40FPS
HIGH SETTINGS	84FPS
MEDIUM	104FPS

BENCHMARKS

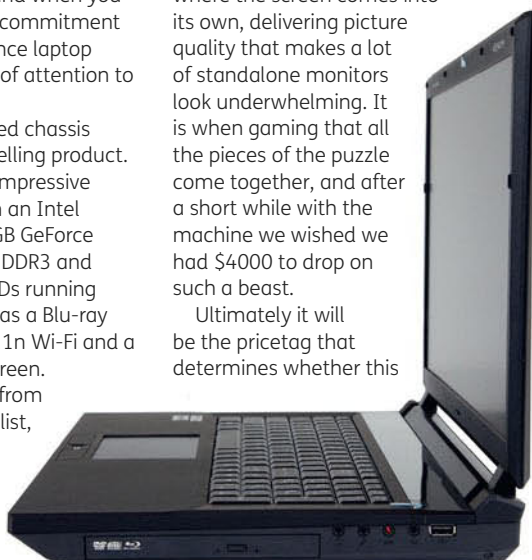
3.4GHZ INTEL CORE I7-2600K, 4GB DDR3 = 1	
OVERALL	1.07
RESPONSIVENESS	0.95
MEDIA	1.16
MULTITASKING	1.07

BATTERY LIFE	HOURS:MINUTES
LIGHT USE	2.06

PERFORMANCE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



GIGABYTE P35K

A WONDERFUL FORM FACTOR THAT SUFFERS FROM THE COMPROMISES MADE IN PURSUIT OF PERFORMANCE

PRICE \$1999
SUPPLIER www.gigabyte.com.au

Until Razer launched its blade gaming laptop last year one had to make the choice of a laptop designed for portability, or one designed for serious gaming performance. The Blade delivered a degree of both, combining a thin and light design with some of the faster mobile components out there, wrapping it all up in a very slick, but costly, package.

Suffice to say, other manufacturers have seen the impact the blade had, and we are starting to see more gaming laptops packed into thin and light chassis designs. One of the models that most impressed us when unveiled at Computex was Gigabyte's P35K, and we have been hankering to get one into the Labs ever since.

At first glance this looks like the perfect compromise product for those who want Blade-like portability without the premium pricetag that comes with Razer's product. However, after spending time using and benchmarking the P35, we have a few issues with the way in which it has been designed, and with the compromises made to deliver a gaming machine in this form factor.

From a hardware perspective the P35K is very well rounded. It sports a 47W Core i7-4700HQ CPU, 2GB GeForce GTX 765M GPU, 16GB DDR3, 256GB SSD and 1TB HDD and a DVD writer (the disc drive can be removed by the user and replaced with another hard drive if one wishes). This all drives a good-looking 15.6in 1080p IPS screen.

This makes for some pretty serious gaming potential, although you will need to tune bleeding edge titles down a touch if you want to run them at 1080p. (Thankfully, this is the sort of situation that Nvidia's GeForce experience is perfect for.) However, while the hardware is great, after a short while it becomes apparent that putting it into such a thin chassis causes some serious issues.

The first of these becomes apparent

when you fire up a game, the CPU and GPU start heating up and the fans kick in. These fans are loud and relatively high-pitched, an obvious side effect of having to jam them into such a thin chassis. We have encountered similar issues with thin and light designs in the past, and know that even if you have the sound cranked up while gaming, you'll have moments when fan noise overrides lulls in the gaming action.

The other issue, which also seems to stem from the thin nature of the design, is that performance plummets when you unplug the P35K from mains power. When this happens the CPU speed drops from the stock 2.4GHz to 800MHz, and does not even appear to turbo up when needed. We tested this aspect with our Crysis benchmarks, which we know to be sensitive to CPU performance nowadays, and the effect was fascinating.

When plugged into the wall and running at full tilt, the P35K delivered framerates of 78fps at medium, 50 at high detail and 20fps at very high. However, rerunning the same tests when the laptop was on battery power led to scores of 31fps at both medium and high detail, before again dropping to 19fps at very high. This indicates that there are two factors influencing the benchmark results – at medium and high the CPU is acting as the hard limit on performance, whereas at very high detail the GTX 765M just doesn't have enough grunt to push out playable framerates. While 31fps is technically playable, it is far from what the laptop should be capable of, and a direct result of Gigabyte's power management design (which isn't changeable through the usual means in Windows).

Even with this aggressive CPU throttling and a noticeable reduction in screen brightness, the P35K only lasted for five hours in our light use battery test. This all points to the major problem we have with the P35K – that there seems to be very little benefit from the move to a thin chassis, and



KEY SPECS

Intel Core i7-4700HQ ·
2GB GeForce GTX
765M · 16GB DDR3 ·
15.6in 1920x1080 IPS
screen · 256GB SSD ·
1TB HDD · DVD Writer

too much compromise.

Because of the drop in performance when running on battery, the thin and light nature of the design means that the P35K isn't really suitable for gaming on the go. You'll still want to plug into the wall in order to do any serious work or play with the laptop.

Ultimately this is a decent laptop for gamers, packing some very nice hardware. However the compromises made to keep this thin and light are, in our minds, too great to make this a standout product. The overall design has potential, but Gigabyte needs to spend some time working on the thermal design in order to reduce fan noise, while also coming up with a better solution than just clocking down the CPU to ensure decent battery life. If it can do this, while still keeping the price reasonable, then the P35K could evolve into something special indeed. For now though, this will remain a competent, if flawed, attempt at mixing performance and portability.

John Gillooly

3D SPEED

GOOD PLAYABLE UNPLAYABLE

VERY HIGH SETTINGS	20FPS
HIGH SETTINGS	50FPS
MEDIUM	78FPS

BENCHMARKS

3.4GHZ INTEL CORE I7-2600K, 4GB DDR3 = 1

OVERALL	0.95
RESPONSIVENESS	0.77
MEDIA	1.1
MULTITASKING	0.99

BATTERY LIFE

HOURS:MINUTES

LIGHT USE	5.00
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PERFORMANCE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



APPLE IMAC 27IN

A FORMIDABLE ALL-IN-ONE, WITH UPDATED HASWELL INTERNALS, BUT AN EVEN HIGHER PRICE

PRICE \$2689
SUPPLIER www.apple.com.au

After last year's iMac redesign, Apple has stuck to the tried and tested in 2013. As such, this year's iMacs are little more than a refresh, with a handful of upgrades.

The most obvious change is the inclusion of new Intel Haswell CPUs. Haswell's prime attraction is energy-efficiency – there's no big step-up in raw performance – with the main beneficiaries being improved battery life for laptops and tablets.

Still, results from the 3.4GHz Core i5-4670 model were impressive. With the help of 8GB of RAM, it scored 0.98 in our Real World Benchmarks, comparable to the 3.4GHz Core i7 Ivy Bridge iMac we tested last year.

Accompanying the upgraded CPU is an updated 1TB Fusion Drive, with its 128GB SSD now connected via PCI



KEY SPECS

3.4GHz Intel Core i5-4670 CPU • 8GB DDR3 RAM • 1TB Fusion Drive • Nvidia GeForce GTX 775M graphics • 27in 2560 x 1440 display • 4 x USB 3 • 2 x Thunderbolt • dual-band 802.11ac Wi-Fi • Bluetooth 4 • 1yr C&R warranty • Mac OS X • 650 x 203 x 516mm (WDH) • Power: 42W idle; 233W peak

Express rather than mSATA, and a similarly improved Nvidia GPU. This time it's an Nvidia GeForce GTX 775M instead of the GTX 680MX, and it produced impressive average frame rates in our gaming benchmarks, with 56fps at Full HD resolution and Very High quality settings.

As is the norm for Apple products, the iMac remains the most visually alluring all-in-one on the market. Its smooth, silver metal back is gently rounded and terminates in an ultra-thin, 5mm edge. It's a triumph in minimalist design.

The star of the show remains that beautiful 27in, 2560x 1440 IPS display. In tests with our X-Rite colorimeter, the results were similar to last year's model, with superb colour accuracy, a contrast ratio of 904:1 and a brightness of 407cd/m2.

There's dual-band 802.11ac Wi-Fi, Bluetooth 4, four USB 3 ports, two



Thunderbolt ports, Gigabit Ethernet and a 3.5mm audio jack.

As an annual update, this year's iMac 27in looks a little underwhelming. It's also more expensive than before; if you want a Core i7, it will cost you \$250 more. So while it remains the most accomplished, desirable all-in-one desktop machine on the market, you'll need deeper pockets than ever to afford one.

Bobby MacPherson

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

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GROUP OF EIGHT

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COOLER MASTER CM690 III

COOLER MASTER'S VENERABLE ENTHUSIAST CHASSIS IS BACK FOR A THIRD ROUND – BUT IS IT GETTING LONG IN THE TOOTH?

PRICE \$130

SUPPLIER www.coolermaster.com

All three of the cases we've looked at this month are within \$40 of each other, so just what each offers for that much more or less than its casemates (a little military humour, there, for the sharp ones) is really quite interesting. As the most expensive of the three, just what is your money getting you with the new CM690 III?

Technically, you're almost getting nothing, insofar as you're getting a much roomier case. But let's work from the outside in.

With its curved fascia blending up from the bottom of the chassis into the top panel, the design elegance of one of Cooler Master's signature cases is evident. A silver highlight strip running top to bottom further emphasises the design, without being too much bling. The unique intake mesh also runs from the bottom of the case to the very top, broken only by a very simply applied sliding cover that hides the IO, power buttons, and a handy little caddy for screws, tools, and other odds and ends.

The top mesh panel is held on by a single screw, and when removed it provides access to a mounting point for

a couple of fans (or a single 200mm number), but is really intended for a 240mm radiator if you want to get into some water cooling. There's a model of the CM690 III with another 240mm mount on the side panel (and there's already one in the front panel), but our review model features a smokey plastic window – making this an even more ideal candidate for a slick, water-cooled rig.

Even out of the box, though, the cooling offered by the single 200mm fan at the front is impressive, and being larger it can push more air for fewer revolutions, making for a quieter machine.

Inside the case there's a tonne of room to play with, as we've already said. Thanks to an embossed panel behind the motherboard plate, there's a lot of space for tucking away cables, and there are plenty of cut-outs for good cable management.

There are some good build options, too, and like the other cases, the CM690 III errs on the side of SSDs over traditional HDDs. There are four slide-out caddies in a dedicated cage for SSDs, and this cage can be removed entirely if you want. If you do, and still want secure SSD space, there's mounting point on the mobo plate, to go behind the motherboard, and one under the ODD cages. All the storage



KEY SPECS

230 x 507 x 502mm (WxHxD) • 7+1x expansion slots • 3x 5.25in bays, 3x 3.5in bays, 6x 2.5in bays • 1x 200mm fan (front), 1x 120mm fan (rear) • 2x USB 2, 2x USB 3, audio ports • ATX.

drive caddies are marvellous little collapsible jobbies that can fit either SSDs or HDDs – very clever.

Every mounting point, apart from the ODD cages, also features rubber sound dampening, and the PSU mount has generously soft rubber grommets that will do a top job of keeping noisy power sources in check. It's possibly the most dust-proof case on test, too, with fine mesh behind each metal mesh panel, and a removable mesh insert on the case's bottom.

The top sliding panel is a bit naff, though, and if it were us we'd just remove it entirely, which is easy enough to do. Ultimately, while the CM690 III's basic design is starting to look a little dated to our eyes, the extra spend on it is definitely justified. It may not be all that exciting, anymore, but it's still a workhorse of a case.

David Hollingworth



BUILD QUALITY
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



CORSAIR GRAPHITE 230T

CORSAIR HEADS INTO THE BUDGET ZONE WITH A STRIKINGLY GOOD-LOOKING CASE

PRICE \$100
SUPPLIER www.corsair.com

I really hope our printers have been able to adequately capture the inherent orange-ness of Corsair's latest budget case, the Graphite 230T. On paper, without seeing the 230T, the idea of an orange case may seem over the top, and even a little bit cross, but in the flesh (or steel and plastic, to be more accurate) the ever-so-slightly burnt tone to the orange really makes it work.

Plus the fact that Corsair's calling the colour Rebel Orange doesn't hurt. It took us a moment, but then it dawned – this is a very good copy of the colour of Rebel flight suits from Star Wars. We pretty much fell in love right there.

However, what took us truly over the line with the 230T is just how bold its design – quite aside from its killer colour choice – is, given the \$100 price point.

Too often you can tell a case's budget status from the lack of polish in the front fascia, from poor plastics to less-than-stellar design. The 230T, though, features a mesh front fascia with a built in dust screen over two front fans with orange LEDs – it's a

really nice effect, kind of like a turbo engine. The power button sits alongside the audio and two USB3 ports, and is stiff and responsive. The upper panel is a metal mesh, unfiltered, with eight rubber grommets to mount two more optional fans. There's another fan at the rear, exhausting air out of the case.

Impressively, the side-panels are each secured by a single metal thumb-screw. We applaud this, as too often at this end of the case price scale you'll get plastic screws – though at least two of them. We'll take metal any day.

Inside the case is a little on the bare side, but still roomy and with clever takes on classic features. Both the HDD caddy and ODD bays use tool-less systems to secure their respective drives, but they're both a little more... low-fi than usual. However, they're both functional, and for all that they're simple, they also have far fewer moving parts than most other tool-free options – I daresay they'll stand up to far more abuse.

The excellent black and orange scheme continues inside, too, and it really would be the ideal case to pair



KEY SPECS

505 x 210 x 440mm (DxWxH) • 7x expansions slots • 4x 2.5in drive bays, 4x 3.5in drive bays, 3c 5.25in drive bays • 2x 120mm fans (front), 1x 12mm fans (rear) • 2x USB3, audio ports • up to ATX • mid-tower; steel and plastic construction.

with one of GIGABYTE's OC boards, which boast a similar colour scheme – that would be an epic build, and with the built-in side mirror you really do want to make the most of the striking colours.

About our only issue is that the main drive caddy, which combines with HDD and SSD bays, is made of a single piece of plastic. It's sturdy, but given this part of the case is traditionally metal, we're not sure what impact a lesser material might have on case longevity. And it might be a little cramped if you're running a monster video card, but if you're gaming at this end of the case spectrum...

Ultimately, we're very impressed with the 230T. It manages to combine style with great hardware access and some canny features. And it certainly makes an impact.

David Hollingworth



BUILD QUALITY
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



NZXT H230 CLASSIC

IT'S SPARE AND SPARSE, BUT WITH A TOUCH OF CLASS...

PRICE \$90

SUPPLIER www.nzxt.com

It's been mentioned elsewhere, but the preponderance of white hardware this issue is a little odd.

White can look good, but it brings a number of challenges when it comes to PC hardware, and NZXT's H230 Classic case tackles them all with varying degrees of success. The most obvious issue is going to be one of, effectively, personal hygiene. It won't take long for the area around the power buttons to pick up a filmy stain from constant use, and the case's front door could, too, build up a similar level of unsightly grunge. It will be up to users to really stay on top of keeping their case clean, so if that sounds like too much effort for you... you may want to look elsewhere.

The other issue is that white is kind of formless, so it's very easy for a white case to look quite blobby. NZXT has solved that with a bold black insert on the main case door, and black highlights internally. Though, speaking of internals, you still have an all-white interior to keep in mind, so if you don't open your case much the built up dust and grime most cases gather could

look quite, er, striking.

Thankfully, the H230 doesn't feature a side-panel window, so any lapse in case-cleanliness will be between you and your hardware.

Build-wise the H230 is pretty simple, and it makes for an interesting comparison with Corsair's similarly priced new Carbide model (page 48). The H230 will cost you, on average, \$10 less, but for that saving you get a mix of different features. On the one hand, you get one less fan, but on the other, you do get foam-lined side-panels and rubber-grommet mounts for the PSU, and mesh along all the lower-mesh panels. You don't have a lot more room for extra cooling, though, with no top mounts – but there's a second mount on the front of the case, and one on the bottom.

The tool-less option in the H230 are plastic, and – very oddly – the HDD drive bays face backwards, out of the right-hand side of the case. Each of the two drive cages can take three SSDs or HDDs, and the top cage can be removed entirely to make room for larger video cards. There's not a lot of room for cable management, and while the official specs cite a good 14mm of clearance behind the motherboard plate for cable



KEY SPECS

195 x 447 x 502mm (WxHxD) • 7x expansion slots • 3x 5.25in drive bays, 6x 3.5/2.5in drive bays • 1x 120mm fan (front), 1x 120mm fan (rear) • 2x USB3, audio ports • steel and plastic construction.

management, in practice the foam-padding makes this a much more congested space. But if you're not installing a tonne of drives or other internals, it should do just fine.

It's plain that NZXT is aiming for a definitely sense of luxury despite the H230's price point. The front door panel hinges smoothly, the power buttons feel nice, and the hi-fi style feet are rubber footed and classy. Less classy, however, are some very literal rough edges. The edges of the steel panels are just a little rougher than we'd like, and the very pointy expansion socket screws are a real danger to anyone blindly trying to plug in cables or pick up their PC. It would be very easy to hurt yourself, which is not a good look.

NZXT are very close to getting it right with the H230. It looks sharp, has some nice features for the price point, and is certainly sturdy. But a couple of poor build decisions make it hard to recommend above other brands in a very competitive market.

David Hollingworth



BUILD QUALITY
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



STEELSERIES RIVAL

THE GAMING PERIPHERAL MAKER DITCHES AMBIDEXTROUS DESIGN FOR A LIGHT, WELL-MADE GAMING MOUSE

PRICE \$99.99
SUPPLIER www.steelseries.com

Steelseries has a reputation for no-nonsense, solid gaming performance. Recent keyboard efforts may not have lived up to our expectations, but we've always had a strong respect for its mice, especially the Sensei, which is one of the most precise, full-featured gaming devices we've had the pleasure to frag with.

The Rival takes a step back from that level of finish, however, to deliver a lighter, simpler mouse design. But can it truly take on the competition?

If you like a bit of heft to your mice, that might be a mark against the Rival from the get-go. It feels almost oddly cheap, it's so light, and it really does take some getting used to, especially if you're moving from a heavier mouse, as we were. Our current mouse of choice is a Razer Ouroboros, and its

KEY SPECS
6x programmable buttons • 2m cable

multipart, metal construction is worlds away from the feather-light touch of the Rival.

However, thanks to typical Steelseries precision, it's easier to come to grips with the Rival than you might think. With an outstanding responsiveness in-game, combined with switches that deliver immediate, sharp clicks, it's a great mouse for FPS players. You can store a profile on the mouse, and the Steelseries' own software allows a high level of customisation, but even out of the box the Rival feels just fine. Its pick-up height is particularly impressive.

Its design, though, will not be for everyone, as it would be a remarkably uncomfortable mouse for left-handers. If you're not one of the one-in-ten, then it feels great in the hand, almost like it's not there. There are two areas of heavily-textured rubber for ease-of-grip, and the smooth coating is cool



and easy to grasp.

In nearly all respects it's another great mouse from Steelseries, but it's just a little too expensive. For a few dollars more you can pick up far more interesting designs, and even wireless models. It doesn't quite have the features of our current Razer choice, and for sheer design and comfort it's not quite there with Corsair's M65. It is very precise, admittedly, but probably too light for many.

It's good... but not our first choice.

David Hollingworth

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

SCULPT ERGONOMIC DESKTOP

MICROSOFT REFRESHES ITS SPLIT BOARD ERGONOMIC RANGE WITH A SUPERBLY ENGINEERED PIECE OF KIT... BUT STILL A CHALLENGING ONE

PRICE \$100
SUPPLIER www.microsoft.com.au

Microsoft's latest desktop set is not going to be for everyone. Combining a separate keyboard, number pad, and bulbous mouse, it covers all your PC input bases, and does so with wireless elegance. It's beautifully designed, too, as well made as it is elegant to look at, with some very well-thought-out features.

However, it is a challenge to get used to.

Keyboards and mice are always very personal things, and therefore very hard to review objectively. In this case, despite its great design, the split keyboard design of the Sculpt is a real hindrance to anyone who is a more or less self-taught typist – like yours truly. I imagine for properly trained typists,

who don't use some weird, broken method of touch-typing that sees odd overlap from the left hand onto the right-hand side of the keyboard, it would be much easier to adapt.

It's also possible that with enough time, say several weeks, I could get used to the Sculpt – but I'd have to suffer one serious drop in productivity, as my word-rate dropped by at least half while using it. It's also a little painful to swap between different keyboards, so if you do like the idea of going ergonomic, it'll be worth your while to get one for every station you type at, at work and at home.

Of course, individual mileage will vary – but we just can't justify the massive change to our typing rate – and it certainly isn't something you'd want to game on! The keyboard alone

is not nearly responsive enough, and the mouse, while great and actually genuinely comfortable for general computing tasks, is just not aimed at performance mousing.

The build of the Sculpt, though, is lovely, from the rubber-padded palm-rest to the magnetic catches on all battery covers and the optional bar that sets the keyboard at a more extreme angle. Even the choice of matte black keys with gloss housing is very attractive.

If you are at all curious about going ergonomic, we really recommend giving the unit a try in-store if you can.

David Hollingworth



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

GIGABYTE BRIX BXPI3-4010

WHEN YOU SEE IT YOU'LL...

PRICE \$900

SUPPLIER www.gigabyte.com.au

The term innovative is bandied around an awful lot nowadays, usually by marketing types, but actual innovation is one of the real rarities in the tech industry. When Gigabyte's BRIX Projector landed in our labs, we figured it to sit somewhere between curiosity and novelty. However, once we fired it up it became clear that this was one of those moments where actual innovation has occurred.

The BRIX projector comes as a barebones system, requiring the user to add SODIMM RAM, mSATA SSD and an operating system to get it up and running. Based upon Intel's Next Unit of Computing (NUC) concept, the system features a Core i3-4010U CPU, with HD 4400 graphics, to which Gigabyte has paired a DLP-based projector, capable of outputting



KEY SPECS

Core i3-4010U • 864 x 480 75lm DLP projector • Barebones system

an image at 864 x 480 resolution.

What results is something with obvious limitations, but so much potential. It isn't going to break any performance barriers, thanks to hardware akin to that found in an Ultrabook, and the projector resolution is admittedly low (one can't even run Modern UI apps in Windows 8.1 – although that may be more blessing than curse).

Once we had the system up and running, though, all of our worries went out the window. The projector outputs a fantastic image in a semi-darkened room (the 75lm brightness means it struggles in brightly lit areas), and even though it isn't HD resolution, videos looked crisp and clear, as did normal Windows desktop programs. Most importantly, we could see all sorts of weird and wonderful uses for the BRIX, from boring kiosk-type solutions to forming an integral part of one colleague's ongoing Star Trek LARPing



(it could even make an underwhelming technology like the Leap Motion useful!).

Of course this isn't a product suitable for everyone, and its barebones nature means a reasonable amount of tech savvy is needed to get it up and running.

Ultimately though, not only is this by far the best implementation of the NUC concept to date, but it is a product that is both unique and innovative without ending up as a pure gimmick.

John Gillooly

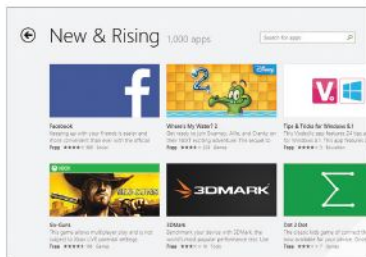
PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★★★★
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★★



Why manage barriers...
...when you can shatter them.

The original OCZ Vector Series broke new ground...

But it's our next generation Vector 150 Series that shatters today's SSD barriers. If you are like most power users, you believe sustained storage performance and endurance are essential to your computing experience. Vector 150 SSDs not only start off fast, but stay fast. They not only manage endurance limitations, but overcome them. When other SSDs fall short, Vector 150 delivers. If you want lasting reliability and performance, here it is.



you use the new Windows+S shortcut to invoke the Search sidebar, however, the juxtaposition of desktop and Modern interfaces feels discordant. We're sure many users will choose to install Start menu replacement tools such as Start8 and Classic Shell.

There's better news for desktop users elsewhere. It's now possible to boot straight to the desktop, and you can choose to list desktop applications first in the Apps menu for easy access. You can even disable the charms, if you want to get as close as possible to the pre-Windows 8 experience.

One subtle change concerns Libraries, which are now hidden by default in Explorer windows. You can bring them back with a right-click, if you so wish. By default, their place is taken by a SkyDrive dropdown, containing folders for Documents, Pictures and Public. As of Windows 8.1, Microsoft encourages users to keep their data in the cloud.

This makes sense, because Windows 8 is designed to be used with space-limited mobile hardware. Accordingly, files in the cloud aren't automatically beamed down to your PC or tablet: when you browse your SkyDrive folder, you'll see both local and remote files; the latter are downloaded only when you access them. Edits are automatically synced with SkyDrive; if you want to keep a file permanently

available on your hard disk, you can do so with a right-click. You can also wipe local copies to free up space while keeping them safely in the cloud.

It's clever, but can become confused if you already have files synced with SkyDrive when you upgrade. We found our folders were marked as only available online, even though they were full of local files. Manually setting the folder to "available offline" resolved the problem.

BUSINESS

With its emphasis on interface updates, you might expect that Windows 8.1 would have little to offer the enterprise. In fact, it introduces some useful "under the bonnet" technologies, including support for Wi-Fi Direct and NFC printing. The idea is to make it easy for individuals to connect their devices to company printers – although we haven't yet had the chance to put this to the test.

The big news is a pair of new features called Workplace Join and Work Folders, aimed at fostering a Bring Your Own Device culture around Windows 8. Businesses running Windows Server 2012 R2 can use Workplace Join to allow personal Windows 8 devices to connect to specified network resources, without giving them full access to the company LAN. Work Folders lets users sync documents with a specified file server, subject to customisable security policies. It's even possible for IT administrators to remotely wipe Work Folders, leaving personal data intact.

VERDICT

The Windows 8.1 update won't silence every criticism of Windows 8. Although the Modern interface is growing more flexible, features and options can still

Updated Apps

Windows 8.1 comes with several new apps, including Internet Explorer 11. The browser features a reorganised layout in tablet mode, with navigation and tabs now grouped together at the bottom of the page, and the maximum number of tabs you can have open has been raised from ten to 100. A new complementary Reading List app lets you save web articles for browsing later, and you can choose to sync your tabs, saved passwords, bookmarks and other settings across multiple devices.

Another app that's been given a major update is Mail. This now lets you select multiple messages using tickboxes, and also drag and drop messages into folders.

The redesigned interface resembles Microsoft's Outlook.com webmail service, and the app has acquired Outlook.com's ability to categorise social updates and newsletters, as well as its "sweep" feature that moves all the messages from a specific sender into a folder.

Another improvement is a more sensible approach to links received in email messages. When you tap on a calendar event or a web link, Windows no longer jumps into a full-screen view of Calendar or Internet Explorer: in Windows 8.1, the relevant app intelligently opens alongside the message in a convenient split-screen view.

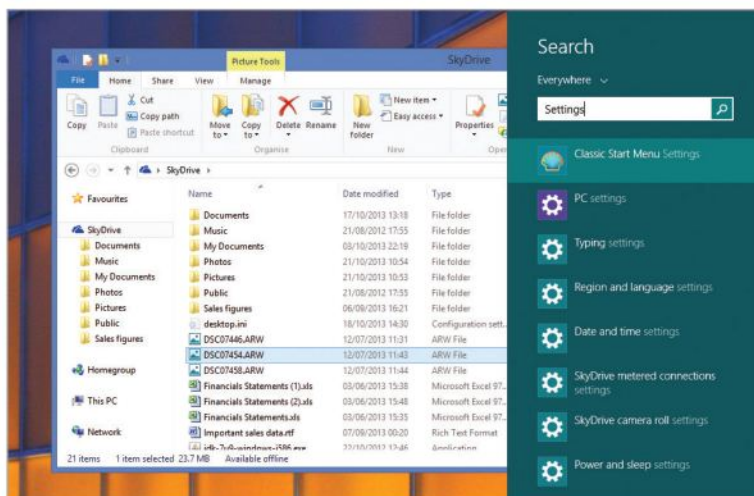
Other updated apps include Photos, which now offers an extended suite of touch-up tools, but loses its built-in integration with Facebook and Flickr. Facebook chat is now handled by the official Facebook app, which is available as a free download from the Windows Store. The Messaging app, meanwhile, has been replaced by an integrated Skype app.

In addition, there are two new lifestyle-orientated apps – Food & Drink and Health & Fitness. Also, while Xbox Music isn't new, it's been overhauled with a new navigation panel that makes it easier than before to find and manage your music.

be difficult to discover, which we feel makes Windows a less accessible tablet OS than Android or iOS. Desktop users will be irritated by the way Microsoft has fudged the return of the Start button. And although the OS's two distinct interface paradigms jog along together more comfortably than in the original release of Windows 8, they still don't form a cohesive whole.

Considering Windows 8.1 is a free update, however, it's hard to complain. You may not agree with Microsoft's overall vision for its tablet-cum-PC OS, but there's no denying that Windows 8.1 evolves it into a much more fluid tablet experience, and brings an overall positive selection of tweaks and enhancements to the desktop. Unequivocally, it's a step forward for every Windows 8 user and administrator.

Darien Graham-Smith



▲ Search now occupies a less intrusive right-hand panel

EASE OF USE

FEATURES&DESIGN

VALUE FOR MONEY

OVERALL



LABS BRIEFS

► ROCCAT RYOS MK PRO

PRICE TBA

WEBSITE www.roccat.org

Over the past year the trickle of Mechanical keyboards has become a flood, with increasing numbers of products all vying for one's attention. Roccat's latest offering sits at the premium end of the range, available with a variety of switch types and packing some very high-end features. The model we tested used Cherry MX Black switches, and features per-key backlighting, as well as extensive macro functions. Ergonomically we quite liked the design, especially the three macro buttons under the spacebar, which are eminently more usable than the usual positioning to the side of the main keyboard area. In fact, the standout thing about this model is that it is a macro user's dream, which will make it a must have for some and a source of needless spending for others. Ultimately, given that we expect it to cost in the \$200 range, it is only really for those who love their macros.

John Gillooly



OVERALL



► COOLERMASTER NEPTON 280L

PRICE TBA

WEBSITE coolermaster.com

Most closed loop water coolers have traditionally been rebranded products made by Asetek or Coolit, but finally we are seeing products designed in-house. Such is the case with this new model from Cooler Master, a dual slot radiator unit designed to mount on both AMD and Intel CPUs (the product comes with all the suitable mounting kits). Cooling performance from the Nepton 280L is excellent, and while we did find the fans a little noisy, we don't see it being a significant issue when mounted into a decently cooled case. The one thing that does concern us though, and something to investigate before purchasing, is that the radiator is wider than most on the market. While there are mounting holes designed to help it fit into most cases, the extra width has the potential to cause problems, especially as most cases are designed around the width of the common dual slot design.

John Gillooly



OVERALL



► TT ESPORTS POSEIDON

PRICE \$129

WEBSITE www.ttesports.com.au

As keyboards seem to increase in size with each new generation, it is nice to see models that deliberately attempt to stay svelt. The Poseidon is barely larger than a standard keyboard layout, with no curvy bits of plastic or rows of macro keys to make it a struggle to keep on one's desk. Its blue backlit keys ensure that it is far from being a no frills option though, and it not only looks stylish but feels incredibly solid when gaming.

This reviewer's only real issue with the Poseidon is purely personal – namely, that it uses Cherry MX Blue keys, the clicky tactile ones that make a pronounced noise with each key press. Of course, we have said many times that one of the great things about mechanical keyboards is the ability to choose a product that suits your personal needs, and there are plenty of people who love this particular choice of switch. (Though, if you haven't experienced the different switch types, we would heartily recommend trying before buying any mechanical keyboard.) Overall, a great product that combines style with a compact design, as long as you like the choice of switch.

John Gillooly



OVERALL



► STEELSERIES SIBERIA ELITE

PRICE \$250

WEBSITE steelseries.com

We've looked at Steelseries' Siberia lineup of headsets many times in the past, but this Elite model is a brand new entry to the lineup. As the pricetag indicates, these are very much premium cans, and the sound quality delivered by them is thankfully excellent, a little bassy but not too much, and generally crisp and clear, even at ear-splitting volume levels.

While we love the audio quality, we are less sold on the aesthetics, and for this fat-headed reviewer, they barely fit. (To be fair, they'll be fine for most.) The chunky memory foam earcups are comfortable though (even if they do make you look you are wearing earmuffs), and are incredibly effective at blocking out sound leakage. For gaming they are fantastic, with the USB sound card enabling simulated 7.1 surround sound. While the aesthetics and fit aren't really for us, those are our only qualms about this excellent set of premium gaming cans.

John Gillooly



OVERALL



► SENNHEISER G4ME ZERO

PRICE TBA
WEBSITE sennheiser.com.au

For many years now, Sennheiser has been our gaming headset brand of choice – it usually commands a premium over the competition, but for great sound quality is incredibly hard to beat.

This year the company has refreshed its lineup in a few key ways.

Firstly, the new models are glossy white, but more importantly the company seems to be moving away from the USB soundcard that previous versions have shipped with. While this means no simulated surround sound, at no point did we find issue with this. The G4ME Zero may have a name that still annoys the hell out of us, but they are not only light and very comfortable, but the memory foam earpads used in this sound isolating model are highly effective. We are less sold on the large unmoveable microphone though – while we can't fault the quality, we wish that we could remove it when not needed. This is a minor quibble though, and yet again we love what Sennheiser has delivered. We don't know price yet, but going off the US one, expect to pay upwards of \$300 for these beasts.

John Gillooly



OVERALL



► TT ESPORTS LEVEL 10M GAMING HEADSET

PRICE \$199
WEBSITE www.ttesports.com.au

While it sometimes feels like BMW design is the only company really making money from the PC industry, one can't help but respect the company for the design work it has done for various manufacturers in recent years. We always knew it'd take its aggressive stylings too far though, and we can't help but feel that these headphones mark that moment. While we try to refrain from judging products based on looks, we are yet to find someone in the office that doesn't think the level 10M headset looks ridiculous.

Which is a shame, because they are fantastic headphones, with clear, crisp audio without the excess bass that mars a lot of modern headphones. They are also light and comfortable, even after prolonged gaming sessions. The swivel microphone does at times feel quite awkward though, looming in our peripheral vision in a most distracting manner. We hate the look but can't fault the audio quality they deliver.

John Gillooly



OVERALL



► BILLION BIPAC 7800NXL

PRICE \$160
WEBSITE www.billion.com

Billion has earned its reputation as a heavy hitter in the networking

market through its focus on delivering great price/performance for educated users, a marked difference from the push towards simplification occurring with other manufacturers. The 7800NXL bears all the hallmarks of this, supporting a raft of connection options, from USB-mounted 3G/4G dongles, cable/fibre connections through a gigabit WAN port, and a built in ADSL 2+ modem. The only real weak point is that it only supports 2.4GHz 802.11b/g/n Wi-Fi, which means that, while all your devices will happily connect to it, the signal is more subject to interference than something operating over the 5GHz band. This is, of course, moot if you only use 2.4GHz Wi-Fi devices, but 5GHz is increasingly common, and a simultaneous dual band product is near mandatory for serious Wi-Fi users. As long as you are aware of this limitation, though, the 7800NXL is an excellent offering, one that may be somewhat daunting for the less tech-savvy type, but certainly delivers for those who love tweaking settings.

John Gillooly



OVERALL



► GIZMOO G-CLEAN MICRO GEL CLEANER

PRICE \$30
WEBSITE www.mln.com.au

Cleaning kits aren't really something we would usually review in PC&TA, but the

introduction of this new Gizmoo brand to the market has had us rethinking that. Since this Gel Cleaner arrived in the office, complete with its quality cleaning cloth, we have been subjecting all kinds of gadgets to it, and have consistently been impressed with the results. Not only is it highly effective at getting the gunk off all sorts of tech, but one only needs to use a small amount, making it something that will last for quite a while. It even passed our ultimate cleaning stress test with flying colours. Atomic readers will remember that the Razer Lycosa Mirror Edition keyboard was one of the worst designs ever made in peripheral history, thanks to all-over glossy plastic. This Gel Cleaner was able to restore a very well used, grime-smudged example of these keyboards back to mint condition, something that we never thought we would be able to do. After seeing cleaning power like that, we are totally sold on the product.

John Gillooly



OVERALL



APPS ROUND-UP

JENNETH ORANTIA REVIEWS THE LATEST AND OCCASIONALLY GREATEST APPS ACROSS ALL THE AVAILABLE MOBILE PLATFORMS

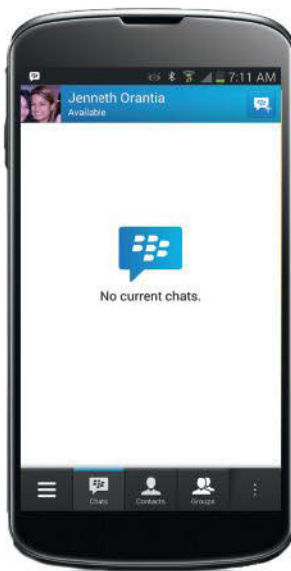
► BBM

Too little, too late. That's our verdict on BlackBerry's BBM instant messaging client, which has recently launched on the iOS and Android operating systems.

In its heyday, BBM was the envy of other mobile platforms, combining the immediacy of SMS with next-gen features like read receipts, in-progress alerts and group messaging. In fact, a lot of people bought BlackBerry's just to be able to use the BBM messaging client.

However, the world has moved on since then. Rich chat clients such as Facebook Messenger and WhatsApp Messenger now offer the same variety of features on multiple platforms with a much larger user base than the flagging BlackBerry can hope to match.

BBM on Android and iOS is nicely designed, but it doesn't offer anything new. If anything, it's lagging behind its competitors, with no location sharing, no options for sending contacts and calendar items, and no voice or video calling function. The version of BBM on BlackBerry 10 does offer a couple of advanced features, such as screen sharing, voice calls over Wi-Fi, and BBM-connected apps, but



PRICE FREE
DEVELOPER BLACKBERRY **PLATFORM** ANDROID, IPHONE

these are sorely missing on the iOS and Android clients.

The process of adding friends to your contact list also seems antiquated. You have to know someone's BBM PIN in order to add them to your contact list, and there's no option to search for friends using their email address or phone number, as is the case with most other instant messaging apps.

Is BBM worth a download? Sure, if you happen to have friends or colleagues that are still using a BlackBerry, or you want to take advantage of BBM's best-in-class encryption technology. But if you're looking for a multi-platform client that will connect you to as many friends as possible, you're better off sticking with one of the more deeply entrenched players like Facebook Messenger or WhatsApp Messenger. BBM's userbase of 80 million active users around the globe simply doesn't compare to WhatsApp's 400 million or Facebook's active user base of more than a billion.

EASE OF USE
FEATURES
VALUE FOR MONEY



OVERALL



► PAGES

Nine years after Pages first debuted, Apple's cross-platform word processor is finally giving Microsoft Word a run for its money.

Pages works seamlessly with iCloud, Apple's cloud storage service, which means you can start a document on one device and continue working on it seamlessly from another device. This same option is available for Microsoft Word users, but only if you spring for a pricey Office 365 subscription, which costs \$12 per month or \$119 a year.

Pages, on the other hand, is available for free on new Macs and iOS 7 devices. For older Apple devices, it costs \$10.49 on iOS and \$20.99 on Mac. There's also a free iWork for iCloud beta available online that can be accessed through any desktop browser.

To be fair, Pages doesn't have anywhere near the breadth of features that Microsoft Word offers, but for day-to-day word processing,



PRICE FREE FOR NEW IOS 7 DEVICES
DEVELOPER APPLE **PLATFORM** IPHONE, IPAD

it's doubtful you'll find anything missing. This applies doubly to the iOS client, which is head and shoulders above any other mobile word processor – even the official Microsoft Word client available for Office 365 subscribers.

A toolbar at the top of the screen provides easy access to common tools such as the undo button, text formatting and embedding rich content, and the on-screen keyboard has also been given a once-over, adding one-touch tools for things like text alignment, font settings and page breaks.

Business users will love the collaboration features in Pages, letting you add comments and highlights, as well as track changes to a document for other users to review. You can also share links to your Pages document through multiple channels, and since all of your documents are stored in iCloud, anyone that has a link to your Pages document will always have access to the latest copy.

EASE OF USE
FEATURES
VALUE FOR MONEY



OVERALL



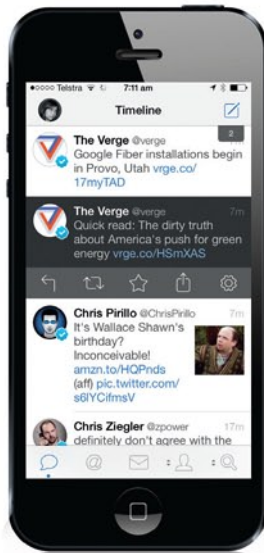
TWEETBOT 3

PRICE \$2.99

DEVELOPER TAPBOTS

PLATFORM IPHONE, IPAD

The best third party Twitter client for iOS has just gotten better. The new update sports an iOS 7-ified facelift, with the same clean white backdrop and minimalist aesthetic, along with some cool 3D graphic effects. As far as navigations and features go, however, nothing much has changed. The same toolbar along the bottom is available for moving between different tabs, and the same options and gestures are available for navigating through tweets. The beauty of Tweetbot 3 is how easy it is to use, and power users in particular will appreciate features like timeline position syncing across devices, drafts, support for multiple 'read it later' and image hosting services, and mute filters and the ability to view photos, videos and webpages without leaving the app. However, scheduling tweets is still not supported.



OVERALL



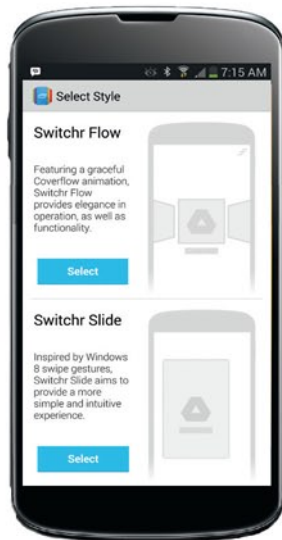
SWITCHR

PRICE FREE

DEVELOPER MOHAMMID ADIB

PLATFORM ANDROID

Annoyed that iOS has caught up to Android when it comes to task switching? Switchr brings the advantage back to the Android camp, letting you customise the task switcher across two different styles. The 'Switch Flow' style lets you navigate between apps using a Coverflow-style animation, while the 'Switch Slide' style uses swipeable cards. The free version of Switchr provides full access to the two different task switcher styles, and the Pro version (available for \$2.06) unlocks the full customisation experience for configuring gestures, setting up whitelists and blacklists for apps that appear in the task switcher, and the ability to set live task switching. The latter feature, which isn't supported on all devices, is a particularly cool function that displays a live preview of the app in the background as you switch between apps.



OVERALL



QUIZUP

PRICE FREE

DEVELOPER PLAIN VANILLA

PLATFORM IPHONE

QuizUp is an addictive online trivia game that tests your knowledge across 250 topics and more than 150,000 questions. What sets it apart from other trivia apps is its huge network of users, letting you challenge people from all around the world on topics as diverse as Game of Thrones, Australia, Michael Jackson and sports. It's also very slickly designed in comparison to other trivia apps, with great graphics, fun background music, rich player profiles and an advanced points system, with trivia challenges consisting of 7 rounds of 10 seconds each. If you sign up with your Facebook account, it automatically imports your profile picture and cover photo for your QuizUp profile, and you can challenge friends. Extra features include one-to-one messaging, discussion boards and localised leaderboards.



OVERALL



HUDWAY AUGMENTED REALITY

PRICE FREE **DEVELOPER** RIT

PLATFORM IPHONE

Want a fancy heads up display in your car's windshield? All you need is an iPhone and the HUDWAY Augmented Reality app. This clever app is a navigation app with a difference. After you plot your start and end points, activating the 'HUD' option reflects your current speed and distance to the next turn onto your car windshield by presenting a "mirror image" display on your iPhone. Of course, there are a few caveats to get this working properly. You'll need to position your iPhone just right to get it reflecting properly on your windshield, using some sort of mat or adhesive to prevent your iPhone from flying across the dashboard every time you make a turn or change lanes. Also, while it works well at night, the iPhone's screen isn't bright enough to reflect off the windshield during daytime.



OVERALL



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GROUP TEST: Ultrazoom cameras

WANT TO GET CLOSER TO THE ACTION? THESE 10 ULTRAZOOM CAMERAS LET YOU FOCUS ON YOUR SUBJECT NO MATTER HOW FAR AWAY IT IS – AND THEIR PRICES START FROM JUST \$225

Most compact digital cameras have a 3x zoom lens that gets you closer to what you need to shoot, but that looks paltry in comparison to the lenses on this month's selection of ultrazoom cameras. These have optical zoom ranges between 20x and 24x, so you really can capture images from a distance. Best of all, these cameras are pocket-sized, which means you don't have to carry a bulky hunk of plastic around with you.

Even better, every model reviewed here can shoot HD video in 1080p or 720p, so you don't need a separate camcorder to capture family occasions and treasured moments.



Merry Christmas



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ZOOM TEMPERATURE

The primary appeal of an ultrazoom camera is its long zoom lens. Even a 12x lens lets you take photos a long way from where the action is happening, but some ultrazooms have zoom lenses of 24x or more. However, you can't simply look at the number to understand the range of a lens. You also need to know the zoom range in millimetres, from wide-angle to telephoto. These are always quoted as 35mm equivalent values, to make comparison easier. The smaller the starting number (28mm, for example), the wider the angle and the more you can fit in the picture. At the other end of the scale, the telephoto number determines how big an object appears in the photo.

Remember, though, that a larger zoom range doesn't necessarily mean better-quality photographs. In fact, the opposite is often true because it's difficult (and costly) to make a lens that delivers excellent results throughout a high zoom range. Some lenses are great at full zoom but aren't much good at wider settings; others are only great in the middle of their ranges. Check our reviews to find out if a lens has problems.

SENSORED IMAGES

All current ultrazoom cameras generally have sensors that measure 1/2.3in or half inch. This is a lot smaller than any DSLR sensor. In smaller sensors, each pixel receives less light, which can lead to poor-quality photos and lots of noise in images. Since resolutions vary between models, those with higher resolutions produce more noise, because less light reaches each pixel. Again, our reviews explain how good each camera's photos are in practice.

Some of the latest models have back-lit sensors. These relocate the electrical wiring (in a traditional sensor) from the front to the back to allow more light to reach each pixel, thereby producing images with less noise in low light conditions. We've seen little evidence that this improves images, sadly.

STEADY ON

Most digital cameras provide some level of stabilisation, but it's an essential feature in cameras with big zooms because camera shake is magnified at higher zoom levels. There are three types of stabiliser: optical, CCD shift and electronic. The first type involves the lens moving slightly to compensate. The second moves the sensor, usually with the aid of tiny magnets. Both types are generally more effective and produce sharper shots than cameras with electronic stabilisation. This last type uses the camera's processor to correct shake.

BLOCKBUSTER MOVIES

Every modern ultrazoom camera is capable of shooting some form of HD video, but the quality of footage varies considerably. Once more, it isn't enough to read the specifications. One camera may take excellent 720p footage while another that claims to record at 1080p may have noisy images and terrible sound.

If video is important to you, one of the most important factors is whether or not the camera can focus and zoom during filming. Video and audio quality is also paramount, but only reviews and example video clips give you this information. Another consideration is video format. Models that record in AVC (MP4) are preferable to those that use Motion JPEG, because the former has more efficient compression and can store more footage per megabyte.

RAW POWER

The ability to shoot photos in Raw mode can be a benefit, because it means you can edit the unprocessed 'raw' image taken directly from the sensor; you get to alter white balance, for example, and how much noise reduction and sharpness to apply. Raw images have no noise reduction, so the full amount of detail is present. You'll have to correct any lens distortion, however. Most cameras automatically do this before saving a JPEG file to the memory card, which is why the image may look distorted in the viewfinder when

shooting, but the problem has gone when reviewing it afterwards.

ASSAULT AND BATTERY

Don't overlook the camera's power source. Those that come with alkaline AA batteries don't last as long as those with rechargeables. Lithium-ion batteries are usually specific to each camera model and can be expensive. In addition, some cameras require you to charge the battery in-camera, so you can't continue shooting with another battery while recharging the flat one.

Finally, although just about every camera comes with internal storage, this

“Stabilisation is an essential feature in cameras with big zooms because camera shake is magnified at higher zoom levels”

is intended for storing a few shots in an emergency when you've forgotten to insert a memory card. Fortunately, a 4GB SDHC card costs as little as \$6, but pay attention to the 'Class' rating. The number indicates the minimum write speed in MB/s. A slower card may be cheaper, but it may also limit the speed at which your camera can take photos, especially in continuous mode. We recommend Class 6 or higher.



GROUP TEST ULTRAZOOM CAMERAS



RECOMMENDED

SLR-SHAPED ULTRA-ZOOM CAMERAS

	CANON	FUJIFILM	NIKON	PANASONIC	
	PowerShot SX50 HS	X-S1	Coolpix P520	Lumix DMC-FZ200	
Rating	★★★★☆	★★★★☆	★★★☆☆	★★★★★	
Megapixels	12 megapixels	12 megapixels	18 megapixels	12 megapixels	
Sensor size	1/2.3in	1in	1/2.3in	1/2.3in	
Viewfinder	Electronic (202,000 dots)	Electronic (1,440,000 dots)	Electronic (201,000 dots)	Electronic (1,312,000 dots)	
LCD screen	2.8in (461,000 dots)	3in (460,000 dots)	3.2in (921,000 dots)	3in (460,000 dots)	
Articulated	Yes	Yes	Yes	Yes	
Touchscreen	No	No	No	No	
Optical zoom	50x (24-1200mm)	26x (24-624mm)	42x (24-1000mm)	24x (25-600mm)	
Optical stabilisation	Optical, lens based	Optical, lens based	Optical, lens based	Optical, lens based	
Orientation sensor	Yes	Yes	No	Yes	
Maximum resolution	4000 x 3000	4000 x 3000	4896 x 3672	4000 x 3000	
File formats	JPEG, Raw; QuickTime (AVC)	JPEG, Raw; QuickTime (AVC)	JPEG; QuickTime (AVC)	JPEG, Raw; AVCHD, MPEG4	
Video resolutions	1080p at 24fps, 720p at 30fps, VGA at 30fps	1080p at 30fps, 720p at 30fps, VGA at 30fps	1080p at 25fps, 1080i at 25/50fps, 720p at 25/50fps, 540p at 25fps, VGA at 25fps	1080p at 25/50fps, 1080i at 25fps, 720p at 25fps, VGA at 25fps	
Slow motion video modes	VGA at 120fps (1/4x), QVGA at 240fps (x)	VGA at 70fps (1/2.3x), 320x240 at 120fps (1/4x), 320x112 at 200fps (1/6.7x)	720p at 50fps (1/2x), 480p at 100fps (1/4x)	720p at 100fps (1/4x), VGA at 200fps (x)	
Maximum video clip length	16m 0s	29m 0s	29m 0s	30m 0s	
CONTROLS					
Exposure modes	Program, shutter priority, aperture priority, manual	Program, shutter priority, aperture priority, manual	Program, shutter priority, aperture priority, manual	Program, shutter priority, aperture priority, manual	
Shutter speed range	15 to 1/2000 seconds	30 to 1/4000 seconds	8 to 1/4000 seconds	60 to 1/4000 seconds	
Aperture range	f/3.4-8 (wide), f/6.5-8 (tele)	f/2.8-11 (wide), f/5.6-11 (tele)	f/3-8.3 (wide), f/5.9-8.3 (tele)	f/2.8-8 throughout zoom range	
ISO speed range	80 to 6400	100 to 3200	80 to 6400	100 to 6400	
Exposure compensation	+/-3 EV	+/-2 EV	+/-2 EV	+/-3 EV	
White balance	Auto, 8 presets with fine tuning, manual	Auto, 7 presets with fine tuning, manual, Kelvin	Auto, auto (warm lighting), 5 presets with fine tuning, manual	Auto, 7 presets with fine tuning, manual, Kelvin	
Additional image controls	Contrast, saturation, sharpness, red, green, blue, skin tone	Dynamic range, film simulation, colour, sharpness, highlight tone, shadow tone, noise reduction	Contrast, saturation, sharpness, Active D-Lighting	Contrast, saturation, sharpness, noise reduction	
Manual focus	Yes	Yes	Yes	Yes	
Closest macro focus (wide)	0cm	1cm	1cm	1cm	
Closest macro focus (tele)	Not stated	2m	1.5m	1m	
Auto-focus modes	Multi, flexible spot, face detect, tracking	Multi, flexible spot, centre, face detect, tracking	Multi, centre, flexible spot, face detect, tracking, target finding	Multi, flexible spot, face detect, tracking	
Metering modes	Multi, centre-weighted, centre, face detect	Multi, spot, average, face detect	Multi, centre-weighted, centre, face detect	Multi, centre-weighted, centre, face detect	
Flash modes	Auto, forced, suppressed, slow synchro, rear curtain, red-eye reduction	Auto, forced, suppressed, slow synchro, red-eye reduction, flash compensation	Auto, forced, suppressed, slow synchro, rear curtain, red-eye reduction	Auto, forced, suppressed, slow synchro, rear curtain, red-eye reduction	
Drive modes	Single, continuous, self-timer, AE bracket, focus bracket	Single, continuous, self-timer, AE bracket, ISO bracket, Film simulation bracket, dynamic range bracket	Single, continuous, self-timer, panorama, 3D	Single, continuous, self-timer, AE bracket, HDR, panorama	
PHYSICAL					
Card slot	SDXC	SDXC	SDXC	SDXC	
Memory supplied	None	26MB internal	15MB internal	70MB internal	
Battery type	Li-ion	Li-ion	Li-ion	Li-ion	
Battery life (CIPA)	315 shots	460 shots	200 shots	540 shots	
Connectivity	USB, A/V, Mini HDMI, wired remote	USB, A/V, Mini HDMI, 3.5mm microphone input	USB, A/V, Mini HDMI	USB, A/V, Mini HDMI, 2.5mm microphone input, wired remote	
Wireless	No	No	No	No	
GPS	No	No	Yes	No	
Hotshoe	Canon E-TTL	Fujifilm TTL	No	Panasonic TTL	
Body material	Plastic	Plastic	Plastic	Plastic	
Accessories	USB cable, neck strap	USB cable, neck strap	USB and AV cables, neck strap	USB cable, neck strap	
Weight	605g	962g	548g	605g	
Size (HxWxD)	90x123x112mm	107x136x155mm	84x125x121mm	87x125x110mm	
BUYING INFORMATION					
Price	\$450	\$700	\$450	\$720	
Supplier	www.canon.com.au	www.fujifilm.com.au	www.nikon.com.au	www.panasonic.com.au	


RECOMMENDED
COMPACT ULTRA-ZOOM CAMERAS

CANON	NIKON	OLYMPUS	OLYMPUS	PANASONIC	SONY
PowerShot SX280 HS	Coolpix S9500	Stylus SH-50	Stylus SZ-15	Lumix DMC-TZ40	Cyber-shot DSC-WX300
★★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
12 megapixels	18 megapixels	16 megapixels	16 megapixels	18 megapixels	18 megapixels
1/2.3in	1/2.3in	1/2.3in	1/2.3in	1/2.3in	1/2.3in
None	None	None	None	None	None
3in (461,000 dots)	3in (614,000 dots)	3in (460,000 dots)	3in (460,000 dots)	3in (920,000 dots)	3in (460,800 dots)
No	No	No	No	No	No
No	No	Yes	No	Yes	No
20x (25-500mm)	22x (25-550mm)	24x (25-600mm)	24x (25-600mm)	20x (24-480mm)	20x (25-500mm)
Optical, lens based	Optical, lens based	Optical, lens based	Optical, lens based	Optical, lens based	Optical, lens based
Yes	Yes	Yes	Yes	Yes	Yes
4000 x 3000	4896 x 3672	4608 x 3456	4608 x 3456	4,896x3,672	4,896x3,672
JPEG; MP4 (AVC)	JPEG; QuickTime (AVC)	JPEG; QuickTime (AVC)	JPEG; AVI (MJPEG)	JPEG; AVCHD, MP4 (AVC)	JPEG; AVCHD, MP4 (AVC)
1080p at 30/60fps, 720p at 30fps, VGA at 30fps	1080p at 25fps, 1080i at 25fps, 720p at 25fps, 540p at 25fps, VGA at 25fps	1080p at 30fps, 1080i at 30fps, 720p at 30fps, VGA at 30fps	720p at 15/30fps, VGA at 15/30fps	1080p at 25/50fps, 1080i at 25fps, 720p at 25/50fps, VGA at 25fps	1080p at 25fps, 1080i at 25fps, 720p at 25fps, VGA at 25fps
N/A	720p at 50fps (1/2x), 480p at 100fps (1/4x)	720p at 120fps (1/4x), 432x324 at 240fps (x)	N/A	720p at 100fps (1/4x), VGA at 200fps (x)	N/A
17m 0s	29m 0s	29m 0s	7m 59s	30m 0s	30m 0s
Program, shutter priority, aperture priority, manual	Auto	Program, manual	Auto	Program, shutter priority, aperture priority, manual	Auto
15 to 1/2000 seconds	Auto	15 to 1/2000 seconds	Auto	4 to 1/2000 seconds	Auto
f/3.5-8 (wide), f/6.8-8 (tele)	f/3.4 (wide), f/6.3 (tele)	f/3-8.7 (wide), f/6.9-20 (tele)	f/3 (wide), f/6.9 (tele)	f/3.3-8 (wide), f/6.4-8 (tele)	f/3.5 (wide), f/6.5 (tele)
80 to 6400	125 to 3200	125 to 6400	100 to 1600	100 to 6400	80 to 3200
+/-2 EV	+/-2 EV	+/-2 EV	+/-2 EV	+/-2 EV	+/-2 EV
Auto, 7 presets, manual	Auto, 5 presets, manual	Auto, 4 presets, manual	Auto, 4 presets, manual	Auto, 5 presets with fine tuning, manual	Auto, 7 presets, manual
Contrast, saturation, sharpness, red, green, blue, skin tone, iContrast	None	Shadow adjust	None	Intelligent Exposure	None
Yes	No	No	No	No	No
5cm	1cm	3cm	3cm	3cm	5cm
1m	1.5m	0.4m	0.4m	1m	2m
Multi/face detect, centre, tracking	Multi, centre, flexible spot, face detect, tracking, target finding	Multi/face detect, centre, flexible spot, tracking	Multi/face detect, centre, tracking	Multi, flexible spot, face detect, tracking	Multi, centre, spot, face detect
Multi, centre-weighted, centre, face detect	Multi, centre-weighted, face detect	Multi, centre, face detect	Multi, centre, face detect	Multi, centre-weighted, centre, face detect	Multi, centre-weighted, centre, face detect
Auto, forced, suppressed, slow synchro, red-eye reduction	Auto, forced, suppressed, slow synchro, red-eye reduction	Auto, forced, suppressed, slow synchro, red-eye reduction	Auto, forced, suppressed, slow synchro, red-eye reduction	Auto, forced, suppressed, slow synchro, red-eye reduction	Auto, forced, suppressed, slow synchro, red-eye reduction
Single, continuous, self-timer	Single, continuous, self-timer, panorama, 3D	Single, continuous, self-timer, panorama, HDR	Single, continuous, self-timer	Single, continuous, self-timer, AE bracket, WB bracket, panorama, HDR	Single, continuous, self-timer, panorama, HDR, 3D
SDXC	SDXC	SDXC	SDXC	SDXC	SDXC, Memory Stick Pro HG Duo
None	23MB internal	39MB internal	38MB internal	12MB internal	50MB internal
Li-ion	Li-ion	Li-ion	Li-ion	Li-ion	Li-ion
210 shots	230 shots	300 shots	230 shots	300 shots	500 shots
USB, A/V, mini HDMI	USB, A/V, Micro HDMI	USB, A/V, Micro HDMI	USB, A/V, Mini HDMI	USB, A/V, Micro HDMI	USB, Micro HDMI, Wi-Fi
Wi-Fi	Wi-Fi	No	No	Wi-Fi, NFC	Wi-Fi
Yes	Yes	No	No	Yes	No
No	No	No	No	No	No
Aluminium	Plastic	Aluminium	Plastic	Aluminium	Aluminium and plastic
USB cable	USB and AV cables	USB cable	USB cable	USB cable	USB cable
233g	202g	270g	221g	198g	165g
63x107x33mm	61x110x31mm	64x112x42mm	69x108x40mm	61x109x30mm	57x96x26mm
\$300	\$300	\$360	\$225	\$370	\$350
www.canon.com.au	www.nikon.com.au	www.olympus.com.au	www.olympus.com.au	www.panasonic.com.au	www.sony.com.au

CANON POWERSHOT SX50 HS

SUPERB PHOTOS AND VIDEOS, BUT PEDESTRIAN PERFORMANCE HOLDS IT BACK

PRICE \$450
SUPPLIER www.canon.com.au

Make no mistake: the 50x zoom in the SX50 HS is enormous. Its 24mm wide-angle setting captures sweeping vistas, while at 1200mm it can see things virtually invisible to the naked eye.

Canon has taken a more restrained approach with the sensor resolution, but 12 megapixels is an enlightened choice. It captures more than enough detail for A4 prints, and helps to keep noise at bay.

Unfortunately, the SX50 HS is quite slow. We measured 1.8 seconds between shots in normal use – a passable result, but three times slower than the Panasonic FZ200. The rapid burst speed of 14fps is only possible with a scene preset. If you keep full control of the camera this drops to 1.9fps, or just 0.9fps with continuous

autofocus. As the screen was mostly blank between shots it was nearly impossible to track moving subjects.

The controls are well laid out, with a dedicated button for moving the autofocus point and a custom button that can be assigned to one-click white balance calibration. The electronic viewfinder's (EVF) small size and low 202,000-dot resolution meant we didn't have much of an urge to use it.

Video capture is at 1080p at 24fps, and the high 33Mbit/s bit rate avoids compression artefacts. However, it also limits clips to around 16 minutes. Picture and sound quality are excellent, with crisp details.

The SX50 HS put in a great performance in our image quality tests, too. Focus was impressively sharp throughout the zoom range, and although it deteriorated a little at the longest focal lengths, it held up better than rival cameras with 42x and 60x zooms. Chromatic aberrations



were more of a problem, though, giving discolouration around high-contrast lines that were visible even after resizing to fit a computer screen.

There was very little evidence of noise in brightly lit shots, and it remained low in subdued light too. ISO 1600 gave print-worthy results, and ISO 3200 shots looked fine at modest sizes. Only the Fujifilm X-S1 could compete at a given ISO speed. However, the FZ200's wider aperture meant it came out on top in most of our low-light tests.

The Canon's middling performance is another big incentive to go for the FZ200. The SX50 HS has lots going for it, though. If a huge zoom is a must, this is the one to go for.

OVERALL ★★★★★☆

FUJIFILM X-S1

SUBLIME ERGONOMICS AND IMPRESSIVE QUALITY IN LOW LIGHT, BUT STRUGGLES IN BRIGHTER CONDITIONS

PRICE \$700
SUPPLIER www.fujifilm.com.au

The X-S1 is bigger than most consumer SLRs. This isn't without good reason, though. Its sensor has twice the surface area of the 1/2.3in sensors used in most other ultrazoom cameras. That bodes well for image quality, but also means lens size must be scaled up accordingly.

The camera's ergonomics follow those of an SLR. Zoom and manual focus are adjusted using lens rings, and there are buttons and dials galore. The electronic viewfinder (EVF) leaves nothing to be desired. Its 1.44 million-dot resolution gives a pin-sharp image that's bigger than any other ultrazoom camera's EVF, and bigger than other consumer SLRs' optical viewfinders, too. A sensor switches between the screen and EVF automatically when the camera is raised to the eye.

The strip of buttons down the left

side of the screen works brilliantly in tandem with the command dial: just hold down a button and spin the dial to adjust. There's rarely any need to visit the menu, which is fortunate, as it's not well organised.

Performance was generally excellent, with 0.9 seconds between shots in normal use, including in raw mode. It's not the quickest camera to switch on, though, taking around three seconds to the first shot.

Continuous mode was quick at 5.4fps, slowing to 1.9fps after six frames. Reducing resolution to six megapixels raised this to 7.4fps for 18 frames, slowing to 3.5fps. Sadly, there's no option to autofocus between shots in continuous mode.

1080p videos are recorded at 30fps, but picture quality fell short. Autofocus was smooth and silent but it only updated when the front dial was set to AF-C.

The X-S1 is at its best in low light, where the physically larger sensor



and modest 12-megapixel resolution did a superb job of keeping noise at bay. The unusual EXR sensor also has a 6-megapixel mode, which reduced noise even further.

The X-S1 didn't fare so well outdoors. Its 26x zoom is unremarkable by today's standards, and chromatic aberrations were a problem at the full zoom. Meanwhile, the ability to resolve fine detail fell short of the competition, particularly the SX50 HS and FZ200.

We still love the X-S1's controls and viewfinder, but performance is mixed and photo and video quality can't match that of the Panasonic Lumix DMC-FZ200.

OVERALL ★★★★★☆

NIKON COOLPIX P520

A MASSIVE ZOOM AT A COMPETITIVE PRICE, BUT IT COMES WITH TOO MANY COMPROMISES

PRICE \$450
SUPPLIER www.nikon.com.au

The P520 is Nikon's top-of-the-range ultrazoom camera, with a 42x zoom, articulated 3.2in, 921,000-dot screen, electronic viewfinder (EVF) and GPS.

It is one of the cheaper models, and the reasons are obvious: the slim battery lasts for just 200 shots, less than half that of most of its rivals; there's no accessory shoe for external flashguns; it can't capture in Raw format; and the 201,000-dot EVF is small and coarse compared to the high resolutions offered elsewhere.

It's not much fun to use, either. Autofocus is lethargic, taking at least half a second, and up to three seconds in low light or at full zoom. Even in favourable conditions with a nearby subject, it managed to capture a photo only every 2.9 seconds.

The controls are slow to access, too. An Fn button can be assigned to various roles, and it's quick to reassign it to a different task. However, this button doesn't make up for the scarcity of labelled, single-function controls and lack of a quick-access menu system.

Manual exposure is well catered for, with shutter speed assigned to the dial and aperture on the rear wheel. Moving the autofocus point using the navigation pad is easy.

The P520 made a better impression in our video tests, capturing sharp details and a bright, clean picture in low light. Autofocus was sometimes slow to update, and noises from the lens motors crept into the soundtrack. We also noticed some compression artefacts in fast-moving scenes.

Photos were also mixed. The lens did well at the long end of the zoom, and although focus didn't live up to the 18-megapixel sensor resolution,



the levels of detail compared well with rivals. However, it wasn't so competitive when shady conditions forced the ISO speed up. The resulting noise reduction made details look smudged and scruffy.

The camera made some very strange decisions about the shutter and ISO speeds, picking shutter speeds as slow as one second rather than raise the ISO speed beyond 800.

We could forgive the so-so image quality at this price, but there are other issues we struggled to ignore, from the poor battery life and performance to the inaccessible controls and lack of Raw capture. If your budget can't stretch beyond \$450, you're better off picking up the SX50 HS.

OVERALL ★★☆☆☆☆

PANASONIC LUMIX DMC-FZ200

FAST, ELEGANT AND EXCELS FOR PHOTO AND VIDEO QUALITY ALIKE

PRICE \$720
SUPPLIER www.panasonic.com.au

The FZ200's 24x zoom is modest by today's standards, but while other cameras' lenses become increasingly dark as they zoom in, the FZ200 maintains an f/2.8 aperture throughout the zoom range. This means there's four times as much light entering the lens for telephoto shots, compared to a typical f/5.6 aperture.

The FZ200 is smart and compact, and there are lots of buttons, dials and switches for quick access to settings. Various functions are available via the Q.Menu button, and the main menu is well organised.

The EVF has a 1,312,000-dot resolution and is as sharp as our eyes can see. It's a shame the view isn't bigger, though.

Performance is excellent, taking just 0.6 seconds between shots in normal use and 0.9 seconds in Raw mode.

The various continuous modes include 10fps shooting for 12 frames, or 5fps for 18 with updating autofocus. Fast shooting is useful in an ultrazoom camera for sports and wildlife, and the FZ200 competes with SLRs for continuous shooting with autofocus.

The video mode is well specified, with 1080p shooting at up to 50fps, 30-minute clip lengths, a microphone input and priority and manual exposure options. Picture and sound quality are excellent, and autofocus responds decisively and silently. It also captures 720p video at 100fps, playing back at 25fps for quarter-speed slow motion. Most slow-motion modes capture at lower resolutions, but this one is ready for serious use.

This is a camera that has been designed to maximise image quality rather than dazzle with big numbers. The 12-megapixel resolution is modest by today's standards, but it helped the FZ200 achieve impressively low noise levels. Meanwhile, focus was



significantly sharper throughout the 24x zoom range than rivals managed from their bigger zooms.

Then there's the constant f/2.8 aperture. It made a huge difference when taking telephoto shots in shady conditions or overcast weather. While rival cameras succumbed to noise, the FZ200's output was clean and detailed. This – and the sharp focus – more than compensated for the modest 600mm maximum focal length, capturing more detail in subjects than other cameras' 1000mm and 1200mm lenses.

It's not cheap, but \$720 is a price worth paying for such consistently high quality.

OVERALL ★★★★★★

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CANON POWERSHOT SX280 HS

NOT PERFECT, BUT CLASS-LEADING PHOTO AND VIDEO QUALITY PLUS SOME GREAT EXTRAS

PRICE \$300
SUPPLIER www.canon.com.au

Pocket ultrazoom cameras make great travel companions, so we're happy to see GPS and Wi-Fi built into the SX280 HS. GPS means you can see exactly where you were when you took a photo, and Wi-Fi lets you upload snaps from virtually anywhere in the world.

The SX280 HS has a 20x zoom, 12-megapixel sensor, manual exposure control and 1080p video recording at up to 60fps. Battery life isn't so impressive, though, rated at 210 shots.

Canon hasn't changed its menu system for years, and with good reason. Pressing the Func Set button reveals commonly used settings as a strip of icons on the screen, while others are available in the main menu. There's a mode dial and rear wheel for quick access to exposure controls.

Performance has improved over last year's SX260 HS, but it still lags behind the competition. We measured 1.6 seconds between shots in normal use, which isn't a disaster, but rival cameras from Panasonic and Sony are twice as fast.

The video mode is a real show-stopper, with a choice of 30 or 60fps frame rates and picture quality that's among the highest we've seen. Details are sharp and precise, and noise reduction cleaned the picture up a treat in very low light. The soundtrack was detailed, too, although the zoom motor was picked up by the microphone. The optical stabilisation did a fine job of smoothing out shakes in handheld telephoto shots.

60fps videos are encoded at 34Mbit/s, which avoids compression artefacts but limits recording times to around 17 minutes before the 4GB file size limit strikes; 30fps recording is more practical (not least because



YouTube converts 60fps to 30fps anyway), giving 25-minute recordings.

The SX280 HS put in a stellar performance in our photo tests, too. Noise was unobtrusive up to ISO 800, and although noise reduction softened details at ISO 1600 and 3200, there was little grain. Focus was sharp throughout the zoom range, and the JPEG processing did a great job of picking out details.

We'd have liked a longer-lasting battery and faster performance from the SX280 HS but, even so, this is the best pocket ultrazoom camera currently available.

OVERALL ★★★★★

NIKON COOLPIX S9500

FEATURE-PACKED AND STYLISH, BUT IMAGE QUALITY IS NOTHING SPECIAL

PRICE \$300
SUPPLIER www.nikon.com.au

The sleek Nikon Coolpix S9500 is well specified, with a 22x zoom, Wi-Fi and GPS. The mode dial lacks priority and manual exposure options but the various scene presets and creative effects will be popular.

We like Smart Portrait mode, which takes a photo automatically when it sees a smiling face. The S9500 has the sense to focus as soon as it identifies a face, allowing it to take a photo quickly when it spots a gentle smile.

The Wi-Fi app is simple but effective, with responsive browsing of the camera's contents and transfers at a choice of sizes from VGA to the 18-megapixel original files. The app can also be used as a remote control for the camera, but control is limited to the shutter button, zoom and self-timer function. Photos are transferred as soon as they're taken, but this

freezes the app for about 10 seconds. Thankfully, you can turn this off.

The GPS function is effective, correctly geo-tagging photos as soon as we turned on the camera. However, we occasionally went to turn the camera on and found that the battery was dead, even though the battery indicator wasn't low the previous time we'd used it. It looks as if GPS remains on even when the camera is off, and the 230-shot battery life is on the short side to start with.

The S9500's basic ability to capture photos and videos is less remarkable. Videos generally looked OK, but details were coarse, low-light clips were noisy and the soundtrack was muffled.

Photos were captured at a rate of one every 1.4 seconds. The continuous mode was much better at 6.9fps, but it stopped after five frames. Photo quality compared well with rivals at the long end of the zoom, with sharp focus from the lens. Fine details were lost due to



noise reduction, though, especially when shooting shady subjects. It also struggled with dense textures such as foliage, but these problems weren't particularly noticeable after resizing to fit a computer screen. Overexposed highlights were harder to ignore, particularly as they bled into surrounding pixels. The 18-megapixel sensor appears to generate a lot of noise in low-light shots. These photos didn't stand up well to scrutiny, but thanks to some energetic noise reduction, they looked fine at typical viewing sizes.

Image quality is on the right side of acceptable, but the S9500 doesn't do enough to distinguish itself from higher-quality rivals.

OVERALL ★★★★★☆

OLYMPUS STYLUS SH-50

DEPENDABLE IMAGE QUALITY, FAST PERFORMANCE
AND LOTS OF USEFUL VIDEO-CENTRIC FEATURES

PRICE \$360
SUPPLIER www.olympus.com.au

The Olympus Stylus SH-50 has a huge 24x zoom, which no other manufacturer has been able to match in a compact camera.

It has five-axis optical stabilisation, which should reduce blur in photos and videos. We didn't notice a huge advantage when taking photos, but the effect on videos was clear. Wide-angle clips glided smoothly as we panned around a scene, and remained stable when we jiggled the camera.

Another useful function is the ability to record videos and photos simultaneously. With the SH-50, you can just hit record and continue to take up to 10 photos.

With such impressive video features, it's reassuring that video quality is up to scratch. Details were precise and crisp, though not quite up to the Canon

SX280 HS's standards, with colours rich and punchy. Low-light clips were noisier than the Canon SX280 HS's but retained more detail in subtle textures.

The Stylus SH-50 performed well for photographic duties, too. It captured a photo every second in normal use, amply aided by responsive autofocus. Continuous shooting was the best we've seen from a pocket ultrazoom camera, managing 11.4fps for 17 frames, and taking just five seconds to save them and go again. Other options include indefinite 2.6fps capture, and 60fps shooting at a reduced 2.7-megapixel resolution.

A strip of icons down the right-hand side of the screen provides quick access to important functions. We'd have liked a wheel to adjust exposure quickly. However, we'd gladly trade this in for the SH-50's touchscreen, which is extremely useful for moving the autofocus point – which isn't possible on many of the SH-50's competitors.



Image quality is perhaps the SH-50's weakest area, but it still ranked above average. The huge 24x zoom helped it to excel at telephoto shots, although it wasn't so impressive at more conservative focal lengths. Focus appeared to be sharp but the camera used excessive amounts of digital sharpening, which made dense textures such as foliage look slightly artificial. Noise levels in low light were reasonably well controlled.

Considering the amount of technology crammed into this camera, it's a shame that Olympus hasn't thrown in GPS and Wi-Fi. That would have made it a six-star product. On balance, the Canon PowerShot SX280 HS is the better camera, but the Stylus SH-50 remains a tempting alternative.

OVERALL ★★★★★☆

OLYMPUS STYLUS SZ-15

A GREAT PRICE FOR A 24X ZOOM, BUT LET DOWN BY ITS
NOISY SENSOR AND SLOW PROCESSOR

PRICE \$225
SUPPLIER www.olympus.com.au

The 24x zoom in the Olympus SZ-15 is the biggest available from a pocket-sized camera. It's a little chunky at 40mm from the front of the lens to the screen, but this gives room for a handgrip that allows comfortable one-handed operation.

There's no dial or rear wheel, which slows down access to controls, but there isn't a huge number anyway; this is a camera that will spend most of its time in fully automatic mode.

There's nothing wrong with simple controls, but the SZ-15's poor performance is harder to forgive. Autofocus was slow, taking over half a second between pressing the shutter button and capturing a shot. Photos took about a second to appear on the screen after capture. The net result was that it took 2.8 seconds between shots, and slowed even further to 4.6

seconds after capturing four photos. Continuous mode wasn't much better, either, lumbering along at 0.4fps.

Shooting in bright light, these 16-megapixel photos looked good close up, too. Details were precise, and while focus deteriorated a little at the long end of the zoom, this was compensated for by the extra range of this 25-600mm (equivalent) lens compared to rivals that max out at between 480 and 550mm.

The lens excelled at macro photography, too. While other cameras' macro modes only work at the widest zoom position, the SZ-15 has a Super Macro mode that zooms in a little and still focuses on subjects 3cm away. It can also focus on subjects 40cm away when zoomed right in, capturing subjects 5cm wide; others are limited to between one and two metres for tele-macro photography.

Using the full zoom extension in anything other than direct sunlight



made the camera raise the ISO speed to avoid shake. Even modest ISO speeds of 200 and up resulted in noise reduction that replaced fine textures with smudges. By ISO 400, details looked scruffy. As a result, the SZ-15 took last place in the majority of our comparative image quality tests.

It fared even worse in our video tests. Recordings are limited to 720p resolution, and even in bright light, shady areas fizzed with noise. Low-light clips were grainy, and soundtracks thin and scratchy. Clip times were limited to eight minutes.

We love the lens, and we've no complaints about the price. However, the only reason to consider this camera is that it is significantly cheaper than the others here..

OVERALL ★★☆☆☆☆

PANASONIC LUMIX DMC-TZ40

EXCELS FOR FEATURES AND PERFORMANCE BUT BEATEN FOR IMAGE AND VIDEO QUALITY



PRICE \$370
SUPPLIER www.panasonic.com.au

A previous favourite, the TZ40 can't quite grab an award in this test, but there are still plenty of good reasons to choose it. The Wi-Fi implementation is as good as we've seen. NFC is built in for automatic configuration with compatible Android devices, although it's not hard doing it manually with devices lacking NFC. Photos and MPEG4 videos can be transferred across, ready to upload to social media services.

The Android and iOS apps also serve as a remote control, with a live view and the ability to move the autofocus point using the phone's touchscreen.

The GPS function is a step up from the norm, too. GPS radios often take a while to calculate their position when they're moved to a new location, but cameras are often used for only

a couple of minutes at a time. One option is to leave the GPS radio on even when the camera is off, but this drains the battery. The TZ40 takes a more enlightened approach, with clever power-management tools providing the best of both worlds.

The TZ40 is quick, at 0.8 seconds between shots. It clocked 8.5fps in its full-resolution mode, although it lasted for only six frames before stopping. More useful is the 4.5fps mode, which refocuses between each shot. It lasted for seven frames before continuing at 1.5fps.

1080p videos are recorded at 25fps or 50fps. Otherwise, the video mode has decent picture quality and a clear soundtrack, but is not quite up to the Canon SX280 HS's lofty standards.

Photo quality is our main area of concern, not because it's bad but because it falls short of the standards set by the SX280 HS. Brightly lit shots looked fine in isolation, but some fine

detail was being lost due to heavy noise reduction. It's a classic case of an excessive megapixel count resulting in less rather than more detail.

This was exaggerated when shooting into the shade at the long end of the zoom, where the shutter and ISO speeds were raised to avoid shake. It was an issue in low light, too. Indoor shots taken without the flash looked fine when resized to fit a computer screen, but on close inspection looked scruffy and vague.

This might ordinarily have knocked the TZ40 out of the running, but we must admit that the superb performance and great features make it a little easier to forgive. If you only ever view photos on screens, the benefits may outweigh the drawbacks.

OVERALL ★★★★★☆

SONY CYBER-SHOT DSC-WX300

SMALL, FAST AND FRIENDLY, BUT IMAGE QUALITY IS DISAPPOINTING

PRICE \$350
SUPPLIER www.sony.com.au

At just 26mm thick and 165g, the Sony Cyber-shot DSC-WX300 slips easily into jeans pockets. There's no skimping on features, with a 20x zoom, 3in LCD screen, mode dial, rear wheel and integrated Wi-Fi. The battery isn't big but it gives 500 shots from a single charge – almost twice the average.

We like the light, slim design, but we'd have preferred the camera to be a little wider. The buttons to the right of the screen are tiny and there's not a huge amount of unadorned space to hold on to.

Otherwise, this is a rewarding camera to use. It's quick to focus, and can rattle off a photo every 0.8 seconds. Continuous shooting is at 6.6fps for 10 frames, and there's an eight-second wait while it's saving them before it's ready to go again.

Wi-Fi implementation is friendlier than most. The accompanying iOS or Android apps are straightforward, with the ability to capture photos and videos, zoom in and out, and control the flash and self-timer.

Video quality was good rather than excellent. Colours looked a little flat, and low-light clips were quite scruffy. We're not too keen on the interlaced format the camera records by default, but you can avoid this by switching from AVCHD to MPEG4 capture.

Image quality was OK, but neither the sensor nor the lens stood up to rival cameras. Focus in wide-angle shots was sharp in the centre but deteriorated towards the edges. As we zoomed in, it got worse in the centre, too. At a 300mm focal length, the WX300 was trailing in last place for focus compared to other pocket ultrazooms. It stayed in last place at the full 500mm zoom extension, too.

The 18-megapixel sensor also struggled with noise when scenes



demand fast ISO speeds. At ISO 400 and above, subtler details were replaced by smudgy noise reduction, and ISO 1600 shots looked decidedly scruffy. Shooting shady subjects at the full zoom extension produced a double whammy of soft focus and heavy noise reduction, resulting in nondescript smears of colour.

It's a shame, because otherwise the Sony WX300 has a lot going for it. We could have overlooked a few quibbles regarding image quality, but these problems were visible even at modest viewing sizes. For us, that knocks it out of the running, and means the Canon PowerShot SX280 HS is the better buy.

OVERALL ★★★★★☆

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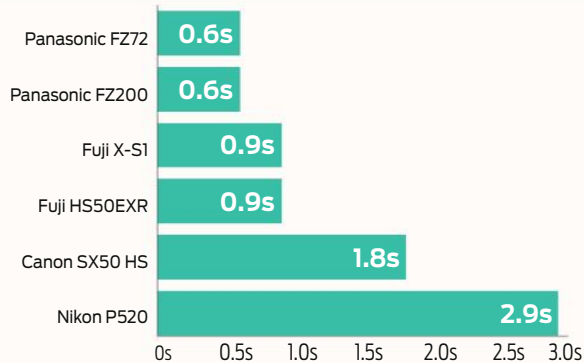
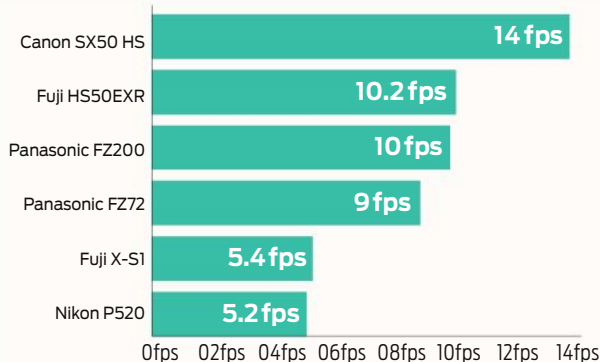
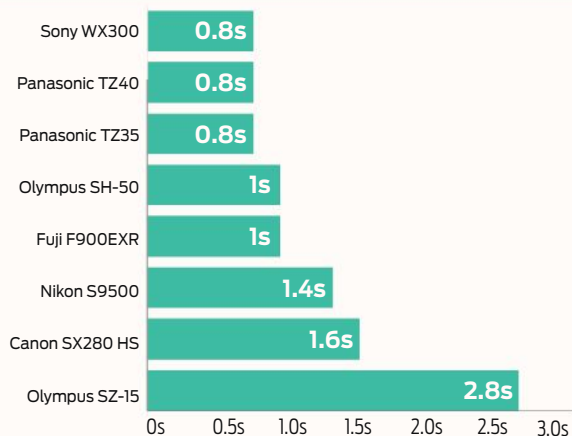
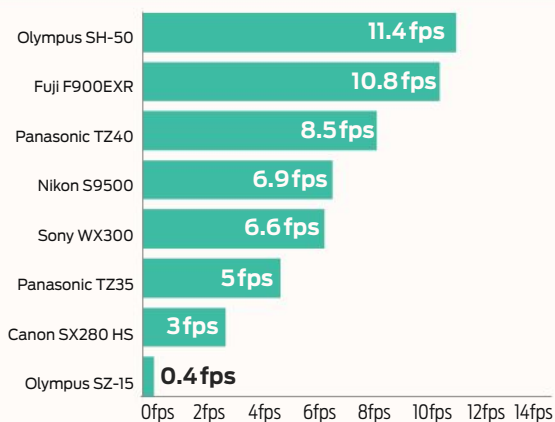
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(SHOT-TO-SHOT PERFORMANCE)****SLR-SHAPED ULTRA-ZOOM CAMERAS
(CONTINUOUS MODE)****COMPACT-SHAPED ULTRA-ZOOM CAMERAS
(SHOT-TO-SHOT PERFORMANCE)****COMPACT-SHAPED ULTRA-ZOOM CAMERAS
(CONTINUOUS MODE)**

These graphs show the time, in seconds, before you can take another shot. All times are a best-case scenario, and some cameras can slow down after a number of shots (see reviews for more details). In these graphs, the lower the number, the better, as this means you can take another shot more rapidly.

These graphs show the number of frames per second a camera can take using full-resolution JPEGs. We've used the best-case scenario, as cameras have a limit to how many shots they can take before their buffers fill up and the images have to be written to an SD card. See the reviews for full details on limitations.

VERDICT

There's a lot of choice and a lot of quality with the ultrazoom cameras that are available, but inevitably there are some that are better than others. Making a decision purely on price is tough, because of the prevalence of grey imports on the market, which leads to massive variation between different retailers.

If you want a camera with full DSLR-style handling, the Panasonic Lumix DMC-FZ200 is the one to get and wins a Recommended award. It produces excellent shots and has

a great video mode and brilliant handling, not to mention its amazing f/2.8 lens. Special mention goes to the Canon PowerShot SX50 HS, which has a large 50x optical zoom and generally excellent image quality throughout the range.

If you're after something more compact, the Canon PowerShot SX280 HS with its 20x optical zoom is hard to beat. It has excellent image quality and brilliant handling, making it our camera of choice and the Labs winner.

**PANASONIC
LUMIX DMC-FZ200**



CANON POWERSHOT SX280 HS

BATMAN: ARKHAM ORIGINS

THE BAT IS BACK, WITH SOME OLD FRIENDS, NEW ENEMIES, AND A LOT OF BRUISED KNUCKLES

DEVELOPER Warner Bros. Games Montréal
PUBLISHER Warner Bros.
WEBSITE batmanarkhamorigins.com/

Developer Rocksteady made one hell of a name for itself with its first two Batman games. Arkham Asylum took one of the most iconic Batman settings of all time, married it with the most iconic villain, and pretty much created action game perfection. Arkham City took that same recipe and added a bigger, more open world where Batman becomes an even bigger character to play. Both games earned some serious critical acclaims, and lots of play time.

Arkham Origins delivers... well. The same open city, with some more bits of city tacked on. And the Joker again. And, until you get a good way into the game, it doesn't even offer much of an origin story – after all, one of the few new things in the game is the Bat Cave, and that's already well and truly set up by the time the game starts.

But really, it's hard to fault newcomer Warner Bros Games Montréal. After all, how do you improve on an already successful formula?

KAPOW

Arkham Origins throws a lot of game at the player. The main plot revolves around the villain Black Mask, and the eight assassins he's hired to kill Batman. Tracking down this thread of the game introduces a lot of other major characters, all ever so slightly different for being earlier in Batman's career. The Penguin, for instance, has



not yet had a Coke bottle jammed into his eye-socket, but is still the same vicious criminal.

There are also plenty of distractions, from random crimes that can earn Batman increased rep with the cops (who at this point, don't trust the Bat, which in reality just makes the cops effectively another gang) if he deals with them, to Most Wanted missions to go after other bad guys.

The most effective piece of storytelling in the game is the introduction of the Joker, and his introduction to the woman who will become Harley Quinn. We also get to see Batman learn to trust Jim Gordon, but these story beats are too brief and too few to really lift the game.

Otherwise, apart from the few setting tweaks, it feels more like an expansion of Arkham City than a whole new game. Everything is slightly improved, and even on Xbox 360 it's still a stunning looking game. But adding in a new grading system that calls you out on good or poor combat doesn't change the fact that the moves you're triggering are largely unchanged from the original.

It may sound like we're damning the game with faint praise, but the fact remains that it is still fun. The fluid combat remains entertaining, and the



PLATFORMS

PC • Xbox 360 • PS3 •
 reviewed on Xbox 360

range of enemies starts to increase much sooner this time around. With the larger play space comes new mechanics, like being able to fast travel in the Bat Wing, though before you can really do that, the game takes an unashamed leaf out of Assassin's Creed's book and makes you wrest control from communication towers that the Riddler has taken over – though his own aims, this time around, are particularly hard to parse.

One particularly neat touch is Batman's increased detecting skills. He can now recreate a virtual crime scene, playing back explosion and attacks like some vastly more brutalised Tony Stark in Iron Man 3. It's not used as well as it could be, but it is a strong nod to one of Batman's main traits.

Sadly, Black Mask is not a strong choice for main villain, though he gets kind of gets sidelined soon enough.

It's hard to really dislike Arkham Origins, built as it is on such strong foundations. But it's certainly not nearly the great leap that the first games were. If you want more of the same, at least, you're in luck.

David Hollingworth



atomic

A solid effort, but not much all that new or exciting

RATING



CALL OF DUTY: GHOSTS

ACTIVISION'S JUGGERNAUT FRANCHISE GOES MILDLY NEXT-GEN, WITH MIXED RESULTS

DEVELOPER Infinity Ward
PUBLISHER Activision
WEBSITE www.callofduty.com/ghosts

Ever since Modern Warfare, Call of Duty has followed a tried and true formula with its annual releases. A single player game in which men shoot other men, explosions go off, the man you are controlling at the time gets knocked out and a new level begins. Sometimes the order of unconsciousness and explosions is juggled, and other times the unconsciousness is permanent, but Activision knows its audience well.

Activision also learned from the increasingly stupid iterations that drove the Tony Hawk Pro Skater franchise into the ground that it shouldn't screw with a winning formula. The more money the franchise brings in, the higher the stakes get, and the more risk-averse the company becomes. In many ways Call of Duty: Ghosts is the perfect distillation of the "too big to fail" nature of modern AAA franchises. It is a supposed step forward for the series to go alongside a new generation of consoles, superficially introducing change while actually delivering more of the same.

To be fair, we've given up on wanting to be wowed by CoD. When the franchise stepped out of World War II and into the now with Modern Warfare, it imparted a legitimate sense of amazement to a single player title that delivered some wonderful storytelling moments and tense setpieces. But the innovation quickly evolved into trope, and what was once the great single

player fps franchise evolved into a more multiplayer-focused product.

In Ghosts, Infinity Ward pretends to step away from its tried and true formula, but such efforts are minor at best. The story does largely focus on one character this time around, and it attempts to introduce themes of family while ramming the awesomeness of being a patriotic American down one's throat. But ultimately it is a hollow experience, and the only lasting feeling for a lot of people who purchase the game for single player will be a sense of regret and wonder at what else that \$90 could have been spent on.

For those into the multiplayer side of things the value inherent in Ghosts is a lot higher. Again, while there are some high-level tweaks to the multiplayer, Infinity Ward knows that it can't make too many dramatic changes to the already winning formula – so there remain things like different kill streak rewards. When the most innovative things in multiplayer are maps that can change over the course of a battle and **gasp** the ability to play as a female character, you know this is yet another example of getting exactly what it says on the tin (or in the case of the PC version, the cardboard box covering the identically-designed plastic DVD case – seriously, Activision, what the heck did the environment ever do to you?)

Not only has this transition to next generation been only superficial from a gameplay perspective, but even more surprisingly the game hasn't made any great technological leaps. When we first saw that the PC requirements for the title included things like 6GB of RAM and 50GB Hard drive space, as well as fairly



PLATFORMS

PC • Xbox 360 • Xbox One • PS3 • PS4 • reviewed on PC

recent GPU minimums, we thought that finally the engine would evolve. However, while textures are higher and postprocessing effects fancy, it still feels like you are playing the most amazing looking Quake 3 mod ever made.

Sure, we don't expect the savant-level graphical wizardry of the Battlefield series. But seriously, in 2013 is it too much to ask for foliage that looks like foliage, rather than high-res GIFs laden with alpha channel transparency? Maybe this will change moving forward when next year's CoD: Insert Title Here doesn't have to straddle console generations, but one can't help but find a modicum of amusement in the fact that so much anger has flown around online discussion forums over the game rendering at 720p on the Xbox One, yet no one seems to care that the engine itself is showing its age.

Ultimately Ghosts is exactly what one would expect. A solid enough entry in one of the biggest gaming franchises on the planet. This is both its blessing and its curse. While it definitely delivers more of what fans want, this sticking to formula opens up huge opportunities for other shooters to swoop in and stamp themselves as the shining lights of the next generation.

John Gillooly



atomic

After all the Eminem and Dog-based hype, what results is merely another CoD game

RATING





BATTLEFIELD 4

DICE DELIVERS ANOTHER EPIC OF DESTRUCTIBLE TERRAIN AND CRAZY ARMOURED WARFARE, WITH A MUCH GREATER RANGE OF ACTION. OH, AND A CAMPAIGN, APPARENTLY...

DEVELOPER EA Digital Illusions CE

PUBLISHER EA

WEBSITE www.battlefield.com/au/

The Battlefield franchise is one of those classic PC titles (yes, also console, these days, but we'll be dead in the ground, etc) that its fans are super passionate about. So much so that when Battlefield 3 released, many fans were horrified at how cut down it was. Smaller maps! No Commander Mode! Too easy! Everything was, apparently, better in their day.

Battlefield 4 seems almost made to deal with the haters, as it were. In the rather wide mix of included maps there are some truly large arenas of destruction. Commander mode is back, and it's really quite well implemented. And, at launch, the game seems much more stable, and the netcode, while still a little dodgy, far sharper in figuring out the ballistics of complex 64-person firefights.

But is it the best Battlefield yet?

That's actually a far harder to question to answer. Despite the additions of the Commander, a whole

new engine in the shape of Frostbite 3, and a vastly overhauled BattleLog system, the game feels more like an extension of Battlefield 3 than a wholly new game. And that's not entirely a bad thing – like Arkham Origins, the Battlefield formula is now pretty set in stone, and it's successful for a reason.

However, in this case, as opposed to Batman, there are in fact enough new things to really make a difference. One of the biggest things that EA and DICE have been pushing is the Levelution mechanic. As a word, it makes a writer cry, but in-game it's something else, sometimes subtle, sometimes truly game-changing. The Beta map, Siege of Shanghai, features a good example of a more subtle effect: during the game, you can bring down one of the soaring skyscrapers, which is pretty drastic (and lethal) for those inside, but ultimately all it does to the map is make things more smokey and cluttered with falling paper.

Paracel Storm, however, which is an ocean map punctuated by small islands, is amazing. It starts off a literal calm blue ocean, but as the game progresses a storm brews. What was a flat sea gets first small waves, then

PLATFORMS

PC • Xbox One • Xbox360 • PS3 • PS4 • reviewed on PC

rolling breakers, and finally a truly chaotic environment of waves, troughs and blinding rain. While on a boat, the terrain is literally changing all around you, making for exciting combat and a whole new kind of spotting challenge.





map variety is far higher than the raw map count suggests.

And features like more interactive doors and environmental bells and whistles really make the maps more alive. And they look stunning – with the latest drivers (and yes, upgrade now) the game is amazing to look at. Explosions are raw and energetic, the debris of a falling building is detailed and gritty. Plus, DICE has done its usual top job on creating the game's soundscape.

It's not perfect, though. The singleplayer game is a short, confusing mess that lacks any sense of cohesive narrative or character, while also managing to make Battlefield's normally expansive gameplay feel cramped and unimaginative. You need to play it if you want to get all the multiplayer unlocks – there are a total of five weapons (admittedly, two are knives) that can only be earned through SP completion.

But that's small beer compared to the intense action the game delivers elsewhere.

Overall Battlefield 4 is a great game, and if you're a fan of the series it could be just what you've been waiting for since BF3. It may not be totally better – yet, as there's a lot more DLC to come – but it's a hell of a mission statement.

David Hollingworth

Otherwise though, it's all pretty much classic Battlefield, though environmental deformation is now far more prevalent in a lot of the maps. One change is that there are fewer long, open sight lines now. Maps tend toward more claustrophobic environments, which certainly cuts down on the power of sniper-rifle-armed Recon players. There certainly are some wide open maps, but even then, snipers don't quite seem the same dominant force – though they are still a lot of fun to play.

The classes have all had some minor tweaks, though that's more to the new spread of weapons and gadgets and when you get them than anything else. There's also more depth to the gadgets on offer, and more ways to get new gear – you can earn Battlepacks through play, which are in effect random loot drops. It's a good system, balancing the steady advance of using weapons with the odd cool bit of loot.

The BattleLog has a lot more detail now, and running it as a separate, web-based service still seems like a good idea to us. You can now track player performance

“Maps tend toward more claustrophobic environments than in previous titles”

from all over the world, or even just your capital city, to see how you compare, and customising loadouts is more satisfying, along with a very cool system for designing your own in-game tag. These show up on weapons and vehicles, and it's a great option for anyone in a clan or regular gaming group.

The maps are a diverse lot, too, with great differences in setting and mechanical impact. Siege of Shanghai may lack long sight-lines, for instance, but its wealth of rooftops are a sure lure for snipers, which in turn become good pickings for well-handled attack choppers. Operation Locker is almost a pure infantry map, and though it does have some vehicles, you can play an entire round without seeing one. There are open maps, forested ones, dark ones, and many in between. They also all play very differently depending on mode and game size, so the apparent



atomic

The great multiplayer shooter of the year.

RATING



THE A-LIST

ONLY THE BEST OF THE BEST MAKE IT TO PC & TECH AUTHORITY'S A-LIST

Our A-List contains a collection of the best products to pass through our testing labs in recent times. We've revamped and trimmed down the previous list, and updated some of the out of date products. You'll also find that we have incorporated the Atomic Kitlog, replacing the old collection of components on the A-List with two potential system builds, a reasonably priced all-rounder and the bleeding-edge perfect PC.

Another thing we have done is to step away from adding pricing to categories like software. Given the amount of fluctuation that we see from month to month, it is worth searching out pricing for yourself. We personally use the price aggregators www.staticice.com.au and www.shopbot.com.au but there are a myriad other options that will give you current pricing for tech items, pricing that will be a lot more timely than anything we supply.

ALSO RECOMMENDED

ADOBE LIGHTROOM 5

★★★★★☆

We really enjoyed our time with the beta, and we're still finding it to be an even more essential suite for photographers of any stripe. However, as the beta is all that's available, we've left Lightroom 4 listed here in the A-List for this issue. But if you're at all curious, check it out for yourself!



PCS DESKTOPS ▼

HIGH-END TI DELUXE 4670K

★★★★★

PRICE \$1885 SUPPLIER www.ticomputers.com.au

With an overclocked Core i5 CPU boosted up to 4.2GHz, and a speedy GeForce GTX 770, this is a great system for anything you could throw at it.

SPECIFICATIONS Core i5-4670K @ 4.2GHz • ASUS Z87-A • 16GB DDR3 • 2GB GeForce GTX 770 • 120GB HDD • 2TB 7200rpm HDD • 750W PSU • Blu-ray combo drive. **WEB ID** N/A



GAMING SCORPTEC THERMALTAKE GTX 760 PC

★★★★★

PRICE \$1499 SUPPLIER www.scorpvec.com.au

This Haswell-based PC strikes a great balance between gaming grunt and cost effectiveness – a great all rounder.

SPECIFICATIONS Intel Core i5-4570; 8GB DDR3 RAM; 120GB SSD; 1TB 7200rpm HDD; DVD-RW; NVIDIA GeForce GTX 760; Thermaltake Chaser A31 case. **WEB ID** N/A



ALL-IN-ONE APPLE IMAC 27IN

★★★★★

PRICE \$1949 SUPPLIER www.apple.com/au

If you can afford it, the 27in iMac is the finest piece of all-in-one engineering on the market. A truly powerful beast with performance to match its looks.

SPECIFICATIONS 2.7GHz Core i5-2500S; 4GB DDR3 RAM; 1TB Western Digital Caviar Black HDD; DVD writer; AMD Radeon HD 6770M graphics; 27in 2560 x 1440 LCD. **WEB ID** N/A



HANDHELDS ▼

SMARTPHONE HTC ONE

★★★★★

PRICE Varies SUPPLIER www.htc.com

The first of the next generation superphones has landed, and HTC has delivered a truly excellent handset, packed with potential.

SPECIFICATIONS 1.7GHz Krait CPU; 32GB internal memory; 4.7in 1920x1080 sLCD3 screen; 4MP camera; 1374 x 68.2 x 9.3mm 143g



TABLET PC APPLE IPAD

★★★★★

PRICE \$539 SUPPLIER store.apple.com/au

Despite the "4G" debacle, the new iPad remains the one to beat, with the new retina screen a real game-changer.

SPECIFICATIONS 9.7in 1536x2048 widescreen Multi-Touch display; 1GHz A5X processor, 16, 32 or 64 GB available; 3G and/or Wi-Fi connectivity; max 652g weight. **WEB ID** N/A



EBOOK READER KINDLE

★★★★★

PRICE \$109 SUPPLIER www.amazon.com

The new model is quicker, slimmer, lighter and cheaper than before. If all you want to do is read books, its simple design and performance are perfect.

SPECIFICATIONS 6in e-Ink screen, 170g weight, 114 x 87 x 166 mm, 2GB memory, 10-day battery life. **WEB ID** 279534



PCS LAPTOPS ▼

VALUE ASUS X202E

★★★★★

PRICE \$699 **SUPPLIER** www.asus.com.au

This touch-enabled Windows 8 laptop may not technically qualify as an Ultrabook, but it comes pretty close, and combines decent performance with a slick design for an excellent price.

SPECIFICATIONS Intel Core i3-3217U; 4GB DDR3; 500GB HDD; 11.6in 1366x768 Touch LCD; Wi-Fi; Ethernet; HDMI.



GAMING VENOM BLACKBOOK 17

★★★★★

PRICE \$3199 **SUPPLIER** venomcomputers.com.au

Packed with powerful components, and featuring some of the best quality video and audio we have encountered, this is a true gaming powerhouse.

SPECIFICATIONS 2.2GHz Core i7-3630QM; 4GB Nvidia GTX 680M; 16GB DDR3; 1920 x 1080 17.3in screen; 1GB HDD + 256 GB SSD; 802.11a/g/n; USB 3.



HIGH-END LENOVO THINKPAD X1 CARBON

★★★★★

PRICE \$2127 **SUPPLIER** www.lenovo.com/au

We've been waiting a long time for a truly modern ThinkPad, and the X1 Carbon does not disappoint. It is powerful, very well-engineered, and looks the part.

SPECIFICATIONS 1.8GHz Intel Core i5-3427U; 8GB RAM; 128GB SSD; 14in 1600 x 900 LCD; 1 x USB 3; 1 x USB 2; dual-band 802.11abgn Wi-Fi; Bluetooth 4; 3G; 3yr RTB warranty; 331 x 226 x 19mm (WDH); 1.36kg. **WEB ID** N/A



ULTRA PORTABLE DELL XPS 13

★★★★★

PRICE \$1899 **SUPPLIER** www.dell.com.au

Our previous favourite Ultrabook achieves perfection, thanks to an update to Ivy Bridge and the inclusion of a gorgeous Full HD 1080p screen.

SPECIFICATIONS 2.50GHz Intel Core i7-3537U; 8GB DDR3; 256GB SSD; 802.11n; Bluetooth 4; 13in 1920 x 1080 screen



PERIPHERALS ▼

WIRELESS ROUTER ASUS DSL-N55U

★★★★★

SUPPLIER www.asus.com.au

A high-speed router that looks striking and delivers everything you could want for home connectivity

SPECIFICATIONS 802.11abgn wireless router; 4 x Gigabit Ethernet ports; 2 x USB; PPOE; PPP; L2TP; 145x63x174mm.

DESKTOP STORAGE SEAGATE 2TB BACKUP PLUS DESKTOP

★★★★★

SUPPLIER www.seagate.com

This 2TB external drive still offers good value despite the rise of higher capacity drives. The USB 3.0 adaptor makes for excellent transfer speeds and the design is tasteful and compact.

SPECIFICATIONS 2TB external hard disk with NTFS; USB 3.0, with other docks available as optional; 44 x 124 x 158mm 894g.

NAS BUFFALO CLOUDSTATION 2TB

★★★★★

SUPPLIER www.buffalotech.com

Remarkably easy to set up, the Cloudstation features support for the highly functional Pogoplug smartphone app, letting you access all your stored data remotely – a great product for the price.

SPECIFICATIONS Gigabit Ethernet; Android and iOS apps; 45 x 150 x 175mm; persistent Internet connection required.

ALL-IN-ONE PRINTER CANON PIXMA MG5460

★★★★★

SUPPLIER www.canon.com.au

The winner of our most recent printer group test, this combines excellent print quality with decent costs.

SPECIFICATIONS 9600 x 2400dpi print; 2400 x 4800dpi scan; USB; 802.11n WLAN; 125-sheet tray; 455 x 369 x 148mm

LASER PRINTER DELL B1160W

★★★★★

SUPPLIER www.dell.com.au

The best all-rounder in our printer group test, with excellent text printing and decent costs.

SPECIFICATIONS 1800 x 600dpi resolution; USB 2; Wi-Fi; 150-sheet input trays; 331 x 215 x 178

SOFTWARE ▼

SECURITY BITDEFENDER INTERNET SECURITY 2013

★★★★★

SUPPLIER www.bitdefender.com.au

The winner of our annual security software group test, coping better with virus cleanup and malware detection than the competition.

BACK UP ACRONIS TRUE IMAGE 2013

★★★★★

SUPPLIER www.acronis.com.au

A clear and well-organised front end makes this easier to use than ever. Not much has changed from previous years, but it remains our go-to backup solution.

OFFICE SUITE MICROSOFT OFFICE 2013

★★★★★

SUPPLIER www.microsoft.com.au

Amidst new touch features, there are some fantastic new additions to the latest office.

WEB DEV ADOBE DREAMWEAVER CS5

★★★★★

SUPPLIER www.adobe.com.au

This edition makes PHP and CMS its core focus, which gives it the new lease of life it so desperately needed.

AUDIO CUBASE 6

★★★★★

SUPPLIER www.steinberg.net

The addition of better tools for live recording pushes this program to new heights and gives it a well-deserved place on the A-List.

VIDEO SONY VEGAS MOVIE STUDIO HD PLATINUM 10

★★★★★

SUPPLIER www.sony.com.au

May not have the bells and whistles of other consumer editing packages, but its tools are efficient.

PHOTO ADOBE PHOTOSHOP LIGHTROOM 4

★★★★★

SUPPLIER www.adobe.com.au

An excellent tool for photo management and light editing, now available at a very reasonable price.

KITLOG

These are two basic systems, with something for every taste. The Game Box is put together with money saving in mind, but also an eye to getting as much bang for your buck as possible. Our build may be a little more expensive than what you could technically get away with, but for that extra few hundred you're also getting cutting edge performance and one of the most overclockable chips you can get today.

The Perfect PC, on the other hand, is the system everyone aspires to, with nothing but the best parts – without going crazy, though. It's a collection of all the greatest hardware that we'd pick without a budget, sure to impress with performance and sheer style.

Whether you choose to go specifically for these builds or use them as a baseline to work on, you'll find that these are the best components and peripherals that we have encountered in recent times. As with our A-List, it is worth checking out price aggregator websites to get the best deal on components, with some parts like RAM and hard drives renowned for varying on an almost daily basis due to market factors.

One thing to keep in mind if you are choosing to build your own PC: you'll need to add the cost of a copy of Windows onto the overall price. At the time of writing, this was around \$150 for an OEM 64-Bit copy of Windows 8. We also don't include optical drives. If you need an optical drive we suggest going for a USB model, which can perform double duty with Ultrabooks and other laptops, rather than being stuck inside your PC.

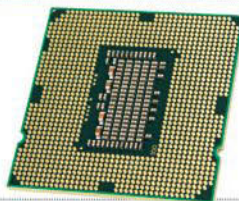
NOW PLAYING

There are some games we come back to time after time, and it's worth calling out these stalwarts of our true, non-reviewing game time. World of Tanks got itself a Hot Award when we first reviewed it, and with update-after-update the game maintains a true example of free-to-play done right (especially compared to this month's Neverwinter). With hundreds of tanks, even more equipment options, and RPG-lite mechanisms for training and improving your crew, it's a real one-more-round kind of game. And it really can be enjoyed quite free, though spending a few dollars can really boost your enjoyment. If you like it, check out our WoT community in the Gaming section of the Atomic forums: forums.atomicmpc.com.au!



THE GAME BOX

CPU



INTEL CORE I5 3570K

PRICE \$245

Remove the Hyper Threading, and save \$150? DEAL! You can always opt for a non-K version CPU if overclocking isn't your thing.

MOTHERBOARD

GIGABYTE Z77X-UD3H

PRICE \$185

Affordable gaming performance and features, without the overkill seen with a lot of gaming-specific motherboards on the market.



MEMORY

G.SKILL RIPJAWS
F3-12800CL9D-8GBXL**PRICE** \$55

Great value, decent performance, and some flexibility. RAM is universally cheap now, so higher capacities are still viable for budget builds.

VIDEOCARD

GIGABYTE HD7870 OVERCLOCKED

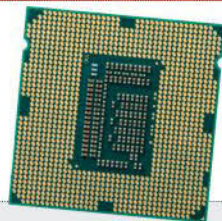
PRICE \$260

Performance close to the 7950, with a pricetag nowhere near. It also looks like there won't be new GPUs for a while yet, so this card will last a while.



THE PERFECT PC

CPU



INTEL CORE I7 3770K

PRICE \$350

8 Threads of Ivy Bridge efficiency. Overclock for justice! This CPU is so good it has rendered the Socket 2011 enthusiast platform redundant.

MOTHERBOARD

GIGABYTE G1 SNIPER 3

PRICE \$380

It's about as super-premium as you could get, or want, thanks to added features like SoundBlaster audio and Killer NIC.



MEMORY

CORSAIR VENGEANCE LOW PROFILE
CML16GX3M4A1600C9B**PRICE** \$120

16GB of fast memory. Virtualise everything! The low profile design means that it won't fight for space with your cooling solution.

VIDEOCARD

MSI GTX N780 LIGHTNING

PRICE \$960

Overkill for most people, this card delivers amazing performance and incredible overclocking ability – you won't need to upgrade for years!



SUBTOTAL: **\$1694**RIG ONLY: **\$1084**

COOLER



ANTEC KUHLER 620

PRICE \$85
Water cooling is the future, today! These closed loop coolers make it much cleaner inside your PC case.

SYSTEMDRIVES



2TB HDD
PRICE \$90
2000 gigabyte storage drive on the cheap. 3TB are coming down in price too.

PIONEER DVR-219L

PRICE \$35
Discs. You need 'em. A USB DVD drive is also a viable alternative.

DISPLAY



LG IPS277L

PRICE \$400
27 inches of IPS glory. The resolution isn't perfect, but the price is. The thin bezel makes this a very attractive screen.

AUDIO

TT ESPORTS CRONOS

PRICE \$80
Fantastic set of headphones that delivers great 2.1 audio for gaming and music without swamping you with bass.



ONBOARD REALTEK ALC889A

PRICE NA
A decent chip that does the job.

CASE



BITFENIX RONIN

PRICE \$99
BitFenix continues to deliver great budget cases that look and build great.

KEYBOARD

RAZER ARCTOSA

PRICE \$50
A cool-looking keyboard that'll serve you very well if you can't afford the jump to mechanical.



MOUSE



CORSAIR VENGEANCE M60

PRICE \$70
Exceptional mousing value with a great, unique design and a very handy sniper mode button for the FPS fans

POWER SUPPLY

SILVERSTONE STRIDER 500W

PRICE \$65
A solid PSU, capable of powering much more if you ever choose to upgrade.

SUBTOTAL: **\$4645**RIG ONLY: **\$3530**

COOLER



CORSAIR H100I WATER COOLER

PRICE \$160
Fits perfectly in the Cosmos S II, mounting directly on the roof!

SYSTEMDRIVES

OCZ REVO DRIVE 3 X2 & WD 1TB VELOCIRAPTOR

PRICE \$490 + \$350
Superfast SSD and zippy storage make for a monstrous system indeed.



DISPLAY



ASUS PB278Q

PRICE \$690
One of the best 27in monitors on the market, with a pricetag that makes us forget the competition even exists.

AUDIO

PLANTRONICS RIG

PRICE \$130
For sheer features and flexibility, possibly the best cans on the market today.



CASE



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HOW TO

Each month our experts get under the hood to provide you with detailed How To guides on hardware, software and everything in-between.

SYSTEMBUILDER

The state of the GPU



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HOW TO

Where to store your media



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SYSTEM BUILDER:

The seismic shift facing Nvidia and AMD

JOHN GILLOOLY IS WORRIED THAT BOTH MAJOR GPU MANUFACTURERS ARE FALLING INTO OLD, UGLY HABITS

Open Standards are truly wonderful things, making for the glue that holds technology together. Without industry-wide agreement on everything from software protocols to hardware interconnects, computing simply wouldn't be where it is today, and we would be stuck in a series of walled gardens, with choice very much a secondary concern.

This is especially true when it comes to the PC, enabling computers to be built from parts manufactured by a massive array of companies. It means that the Taiwanese motherboard you buy will fit into a case designed in Europe and powered by a PSU engineered in the US, then populated largely with components of your choosing, not ones made by the same company. You can build a PC with a different manufacturer for each individual part, and the standards glue will ensure that everything works harmoniously.

This importance carries across to the realm of software - after all, it means nothing if your parts communicate at a hardware level

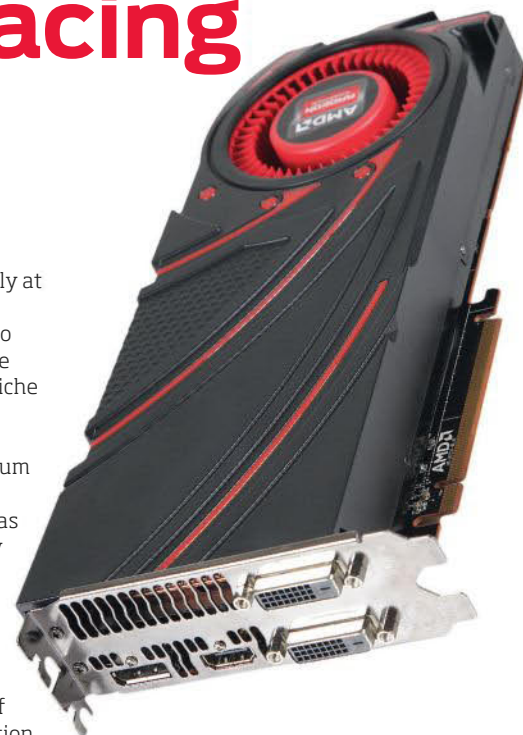
then refuse to act harmoniously at a software one. This enables a variety of operating systems to exist, from the juggernauts like Windows and Linux, to more niche products like BeOS.

There are, of course, myriad different points in the continuum between closed and open standards. Let's take graphics as an example, which is currently the focus of my ire.

When the first 3D accelerator cards launched, and the very term GPU didn't exist, they required specific programming for each brand of chip. 3dfx had Glide and Rendition had RRedline, for example, and games needed to be specifically coded for each of these in order to enable hardware support.

This provided a significant barrier to what was a very nascent market. Not only did coding for 3D accelerators target a minimal subset of the PC gaming audience, but this was further fragmented into different APIs. Even then, when the concept of AAA and Hollywood sized budgets didn't exist, it took significant developer time, and hence money, to code in support of different APIs. If it wasn't for intensely curious genius coders like John Carmack writing 3D support into iconic games like Quake, then 3D would have had a much rougher road to acceptance.

Some people won't even remember companies like 3dfx or Rendition, because ultimately this insistence on proprietary development sowed the seeds of their demise. Despite both companies gaining early footholds in the market, they ended up losing to some



upstart newcomers that focused on developing for standardised APIs - like OpenGL, which had its roots in the professional rendering arena, and DirectX, which was to many a Windows-specific OpenGL analog - and a major play to shore up Windows as the PC gaming platform by acting as a middleman between the 3D hardware and the games themselves.

The upstarts in question were Nvidia and ATI, both of whom spent many years effectively implementing the entire OpenGL pipeline in silicon, which was dubbed Hardware Transform and Lighting. This enabled developers to write their games in OpenGL or Direct3D and know that such 3D accelerators would be able to understand their code, no matter who made them. 3dfx had a workaround known as a Glide wrapper, which translated between languages, but the growth of these standards-compliant cards proved even more compelling to developers and consumers than the raw market share that 3dfx enjoyed

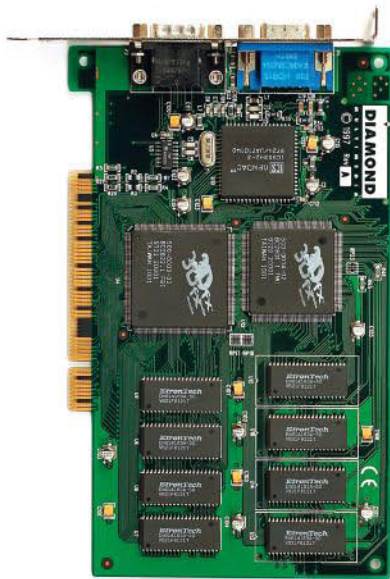


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as a pioneer of the industry.

With the introduction of DirectX 8, which brought with it the concept of programmable shading engines, Nvidia and ATI solidified their positions in the market, with the GeForce 3 GPU and Radeon 8500 VPU (Visual Processing Unit - eventually ATI just gave up and started using GPU as well) respectively, and effectively turned gaming graphics into a two-horse race that was made possible by both players' support of a common API. The pairing of programmable hardware with DirectX also enabled Microsoft to minimise any threat from Linux, as OpenGL was effectively stagnant while DirectX went through a massive phase of evolution to support the advances in GPU design.

A HAPPY MEDIUM

For consumers this meant competition focused on price/performance, quality-of-life improvements like anti-aliasing and anisotropic filtering. For developers it meant an end to the decision about which subset of graphics cards they would support. Having a consistent API meant that games could reach the widest possible audience - the only real prerequisite was a GPU that supported the version of DirectX that was used by the developers, and unlike coding for different APIs, games could easily straddle generations of DirectX, which in

turn meant that gamers weren't compelled to upgrade every time a new card emerged.

Even though the work done on DirectX created one of the most enduring threats to PC gaming, namely Microsoft's Xbox consoles and the relegation of Windows gaming to second class citizen in the Microsoft priority list, it also ensured its survival, by allowing games to target the broadest range of systems and in turn ensuring that one GPU manufacturer didn't come to dominate the landscape.

This somewhat harmonious focus on DirectX functionality lasted for quite some time, but slowly we have been seeing proprietary 'features' creeping back into the GPU market. Sometimes they are niche add-ons, like some anti-aliasing technologies, but the most prominent of these features have come from Nvidia. Not only did the company acquire physics accelerator manufacturer AGEIA, but it has pushed its CUDA GPGPU technology heavily to the detriment of the standards-based OpenCL tech.

After some befuddling initial wins for CUDA, such as its use as the exclusive GPU acceleration on the initial versions of the Mercury engine used by Adobe Premiere, it has never really hit critical mass for consumers (where, like gaming, it is insanity for developers to artificially preclude a large chunk of potential software sales by requiring a specific brand of GPU). It has made more wins in high performance and enterprise software, but we

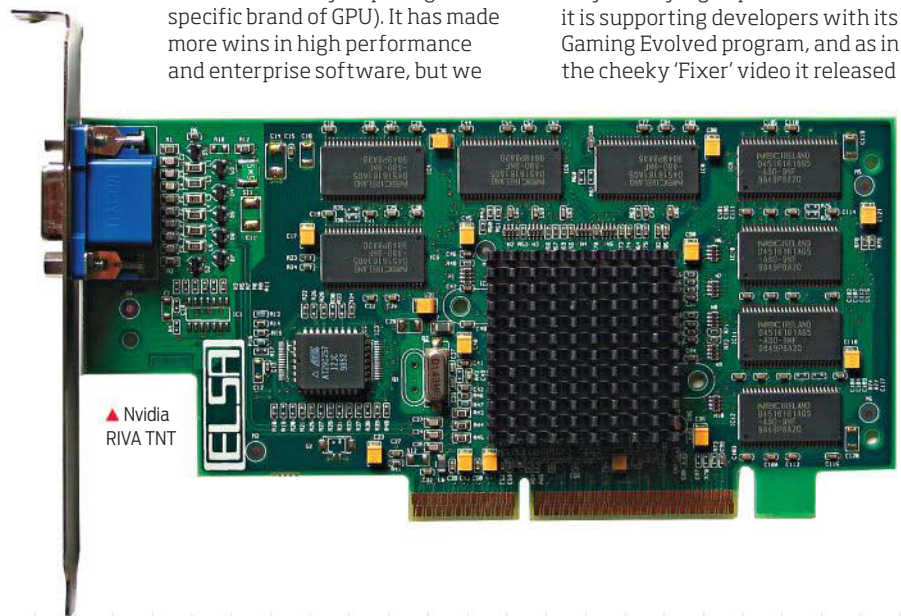
are seeing more and more products return to OpenCL (which has become even more compelling now that Intel's Integrated offerings feature support).

PhysX has certainly been used in a wide range of games, but ultimately it is only ever employed as a tool for visual effects, such as increased debris and really floppy cloth. The initial promise of physics acceleration, and its ability to enable developers to bake high level physics processing into the DNA of the games themselves, has never happened - because, again, this would exclude a fairly large number of potential customers.

ATI and its current owner AMD have always been big advocates of open standards, yet despite the criticism levelled over the years at Nvidia, it is now starting down the path of proprietary technology as well. There have been some nods at open technologies, like the hair rendering TressFX technology that was deployed in Tomb Raider. Unfortunately this just ended up running poorly on AMD cards and even worse on Nvidia ones, but you could at least run it across different manufacturer's cards, unlike PhysX.

DEVELOPER RELATIONS FIGHT!

We have been seeing a shift in attitude from AMD, however. Not only is it trying to push the fact that it is supporting developers with its Gaming Evolved program, and as in the cheeky 'Fixer' video it released



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early this year, it even went so far as to claim that games run better on its cards because of this fact (seemingly ignoring any allegations it levelled at Nvidia over the years about The Way It's Meant To Be Played). The notion that it spends money with game developers to ensure that its cards are better supported over the competition is a worrying one indeed, especially when titles like Tomb Raider are released with serious performance issues on Nvidia cards.

That situation is a particularly confusing one - we have been told in the past by Nvidia that its driver teams were excluded from receiving Tomb Raider code in the weeks leading up to launch (and hence were unable to ensure that the drivers were up to scratch), but when we put it to AMD recently we were told that the shaky performance at launch was due to the relatively late implementation of TressFX and that Nvidia wasn't precluded from receiving code pre launch. The evidence cited was that there were performance issues on both manufacturers' hardware at launch (though more pronounced with Nvidia cards).

Over the years we have been subjected to creatively spun versions of reality by both sides of the GPU market, so we still don't know who to believe over this situation - either way it is worrying that the very act of focusing on technology developed by one company ends up diminishing the gamer's experience of a title.

Of the technologies announced as part of AMD's GPU14 event

driver that bypasses DirectX and lets developers interact closely with AMD's Graphics Card Next (GCN) architecture. This, by its very nature, means that Mantle is only going to deliver on AMD hardware, and that a majority of gamers out there who use Nvidia cards (which are most definitely NOT based on GCN) will not see any benefit. Not only that, but developers will need to write for DirectX and Mantle if they want to avoid excluding a huge number of potential game sales, and in the high stakes environment of AAA gaming this is quite simply corporate suicide.

Don't get us wrong, Mantle is an exciting technology indeed, if only because it removes the increasingly bloated roadblock between code and silicon that DirectX has become. It also allows titles to move more easily between the GCN based Xbox One and PlayStation 4 consoles and the PC itself - but one only has to look at the fact Mantle will debut with Battlefield 4, a title that is tied in with what is rumoured to be a very significant promotional spend by AMD, to see why it faces a pretty major uphill battle in order to gain widespread acceptance. Even subsequent announcements that titles like Star Citizen and Thief would support Mantle weren't enough to reassure us. (These titles were both integral parts of AMD's GPU14 event anyway.)

TAKING THE STEAM OUT OF GPU14

In many ways AMD's announcement should have been more exciting than it was, but apart from the inherent



▲ OOOOHHHHH
TressFX hair!

AMD's GPU14 festivities were occurring in Hawaii, AMD clearly wasn't prepared for the fact. If anything it accidentally put its foot in its mouth when graphics CTO Raja Koduri proclaimed that the company would have good news for Linux users soon - most journalists in attendance assumed this meant something SteamOS related, but the event ended with Koduri having to make a generalised statement that the company had been working with Valve and would announce something soon.

This happened around the exact same moment that Nvidia was emailing us, alerting us to a blog post about its close involvement with SteamOS. If AMD had any serious involvement with Valve's offering we would have assumed a similar release of information, even if it had to be hastily put together. Instead, Nvidia's involvement was solidified in the following weeks, when the specs of Beta Steam Machine units were announced and featured Nvidia GPUs and Intel CPUs.

In many ways, despite the one-sided nature of the hardware, this was Nvidia at its most open - its involvement with SteamOS will flow on into the wider Linux ecosystem. I'm completely avoiding the 'open driver' arguments that inevitably occur when this is talked about, but I'm aware of the issues with closed drivers, something that isn't likely to change and ultimately won't affect the success of Linux as a gaming platform and a textbook example of how the nature of the serious Linux development community can work against acceptance of the OS.

"We've seen creatively spun versions of reality by both sides of the GPU market"

some were designed to work with minimal impact - TrueAudio is a good example, an acceleration technology that allows for higher quality audio effects through middleware - you'll get better positional sound, for example, when you play a supported game on a card that features TrueAudio, but you won't have a significantly deprecated experience if you don't.

Others, like the much hyped and little explained Mantle, are by their very nature exclusionary. Despite the fact we were told that Mantle wasn't proprietary, and that it would be opened up for anyone down the track, by its very nature it is a

issues with the relative openness of the project, it came during the week when one of the most significant announcements in the recent history of PC gaming was made.

That announcement was SteamOS, Valve's ballsy move towards Linux as the way forward for PC gaming. It was an announcement that would have been laughed off if anyone else had made it, but Valve has consistently shown that it gets PC gaming better than the hardware vendors, or indeed Microsoft.

One of the major reasons SteamOS stole a chunk of AMD's thunder was that, despite the fact it was announced at the same time as

NVIDIA ISN'T BLAMELESS

Unfortunately, this rare return to computing standards was shortlived. A few weeks ago, at an event in Montreal, Nvidia announced new technologies like G-Sync, designed to fix the problems with monitor refresh rates that have plagued us ever since LCD took over from CRT. Again, rather than working with others and coming up with an industry standard solution, G-Sync seems to be a double whammy of proprietary technology. Not only does it require an Nvidia GPU to run, but it appears to be exclusive to Asus monitors for the foreseeable future, making it less and less exciting by the minute.

Fundamentally the issue with these recent moves in gaming is that we are returning to a situation where the GPU manufacturer that forks out the most money will get its slant on the fundamental standards implemented. If we take Steam's Hardware survey as a snapshot of the distribution of hardware across PC gaming rigs, we can see just what a perilous path this is.

THE NUMBERS GAME

If you go all in with Mantle then you risk only appealing to 33% of the PC gaming audience that owns AMD cards. Even if you assume a degree of arrogance from AMD that expects people to upgrade just to take advantage of Mantle then you are still almost guaranteed to sell half as many games as you otherwise would - in the end what results is a situation like Battlefield 4, where AMD has pumped large amounts of cash into development and will get a subsequent Mantle patch as part of the return. If anything, this will become a showcase of Mantle, one that will likely deliver all sorts of



fancy performance boosts and clear benefits over the DirectX version, but won't actually change anything.

It won't be until we see multiple titles supporting AMD's new driver that it will start to become compelling, and even then given the massive budgets and high stakes financial risks behind AAA titles, one wonders how long it will be before the bean counters ask the serious question of whether serving 33% of the PC gaming market with a significant chunk of development time is worthwhile. Especially when you consider that the game will have to support DirectX anyway, for fear of alienating the majority of gamers in favour of the Radeon toting few.

Perhaps the best analog for this situation is PhysX, which has been used to varying effect in a subset of major games. The finest implementation of the technology to date has been Borderlands 2 - run that game on a PhysX enabled card and you'll experience a wondrous amount of debris and destruction during gunfights. While this adds

▲ Borderlands 2
utilising PhysX

to the experience notably, its absence doesn't make the game less enjoyable. It is pure eye candy, and avoids impacting the gameplay itself.

Fundamentally, while we have serious issues with proprietary technology, we can't help but worry that Mantle has AMD blithely relying on its console wins and ignoring the more fundamental shift set to happen in PC gaming. Rather than focusing on developing a low-level driver technology that is only applicable to a subset of 33% of the PC gaming market, it should be scrambling to ensure that its OpenGL support is improving at a rapid pace.

It all comes back to SteamOS and the way in which it cuts Microsoft out of the PC gaming equation. Both it and Mantle are designed to get around the bloat built into DirectX, but unlike Mantle, Linux is able to run on a wide variety of platforms. In this case OpenGL continues to be OpenGL, but Mantle turns into another Glide. OpenGL brings benefits for gaming on MacOS as well, whereas Mantle appears for all intents and purposes to be a Windows based technology.

Quite simply, AMD can't keep flinging money at every big developer to ensure that its technology is supported at the exclusion of others. At least Nvidia seems to have learned that value-add tech needs to sit on top of standards, whereas AMD seems to think that it can forge a path by ignoring the combined efforts of others. This is a dangerous thing indeed, especially when it doesn't have a commanding market share to leverage to ensure that its technology will sell more GPUs. ■



HOW TO: Where to store your media

UPGRADING TO AN SSD CAN LEAVE MUCH OF YOUR DATA HOMELESS.
DAVID BAYON EXPLORES YOUR STORAGE OPTIONS



Paul Butland, 32, is a hoarder. This being 2013, his hoarding takes up almost no physical space, but his digital home is stuffed to bursting with junk he never uses. "I started by ripping my whole CD collection years ago, and I've never really stopped," he explains. "Right now, I have around 120GB of music on my hard disk, and - I probably shouldn't say this - thanks to BitTorrent, my movie and TV collection is about ten times that. I also keep all the raw photos I take,

which I don't really need to do, and I've no idea how big my games library is right now. It's pretty big."

Paul might sit at the bulging end of the hoarder scale, but his situation isn't unusual. The rise of one-click downloads, fibre internet connections and hard disks with capacities in the terabytes have combined to make us blasé about what we accumulate on our PCs. This was fine until SSDs came along and forced us to think once more about what we're storing.

A new laptop purchase can induce

a headache. A MacBook Pro with 1TB of flash storage will set you back \$1020 more than the 256GB model. Back in the real world, most people's budget for an Ultrabook is unlikely to stretch beyond a 256GB or even a 128GB SSD, which isn't nearly enough for someone like Paul. His headache worsens in mobile, where every tablet and smartphone comes with its own bundled dilemma: how do you decide which parts of your music collection you'll want to listen to?

While we wait for SSD capacities

to catch up with our excesses, there are ways around the problem. In this feature, we'll look at the pros and cons of a variety of alternative storage options, from the simplicity of an external hard disk to the always-on convenience of the many cloud services set up for just this kind of scenario. So, don't bin that back catalogue just yet.

EXTERNAL HARD DISKS

An external hard disk is the most basic storage solution. It can sit in a drawer and gather dust before being whipped out and plugged in when a file is needed. It's most suitable for bulk-

"If you're replacing a laptop or PC, it's often cost-effective to recycle its hard disk"

storing a single user's media collection, and for a straightforward dump of excess data, it's hard to beat.

The key things to look for when choosing a drive are the capacity and the connection: we're dealing with huge amounts of data, so it's essential to get one with USB 3 for the best possible transfer speeds (provided you have a USB 3 port on your laptop, of course) and compatibility with a wide range of devices.

We recently compared the performance of a LaCie Rugged drive

using USB 3 and USB 2 and the results were emphatic. Copying a 5GB folder to the drive took 4mins 15secs over USB 2 and 1min 56secs over USB 3; reading a 1GB set of photos from the external drive took 42 seconds over USB 2 and 19 seconds via USB 3; and the maximum measured transfer speeds were 116MB/sec and 42MB/sec respectively. Switching to Thunderbolt only saw slight performance gains, so unless you use only MacBooks, we'd recommend sticking with USB 3 drives – particularly since they'll also work with USB 2 devices.

The days of needing desktop drives for large capacities of data are long gone. Today, you can buy 2.5in external disks that hold up to 2TB, and the prices are falling all the time. The 2TB Western Digital My Passport with USB 3 will set you back roughly \$170 if you shop around online, with 1TB drives dipping as low as \$80. If you don't mind a bulkier 3.5in model (and the fact it needs to be plugged into the mains), you can get a 3TB Seagate drive for only \$150.

That may be overkill. When you're replacing an existing laptop or PC, it's often more cost-effective to recycle its hard disk. Just open up the case and unscrew the drive, then slot it into a USB 3-equipped enclosure to turn it into an external drive. Icy Box's 2.5in enclosures cost around \$25; 3.5in desktop drive enclosures start at \$35.

Finally, if you have multiple spare

hard disks lying around, a direct-attached storage dock may be more convenient. Keep your hard disks carefully labelled and ordered, and simply slot them one at a time into a dock such as the Thermaltake BlackX Duet 5G USB 3 dock (\$70) to access the files immediately without the need for enclosures. This dock can cope with two disks at a time if you have multiple spare drives. If you do go down this route, be sure to protect your bare disks from dust and direct sunlight when they're not in use.

As for keeping your collection safely stored externally, it's as simple as dragging and dropping all the files onto the new disk. By default, the Windows Libraries point to the standard locations on your primary hard disk, so you'll want to direct them towards the external disk. Open an Explorer window and expand Libraries in the file tree, then for each of Music, Videos and Pictures, right-click and select Properties. This brings up a list of the folders to which the Library currently points; it's a matter of clicking the Add button and navigating to the relevant folders on your new external drive. From then on, every time you connect the disk, your media will appear in your Windows Libraries, and you can safely delete the local files.

You can direct Windows to assign your external drive the same drive letter every time it's plugged in. Follow the instructions on the Microsoft



▲ External hard drives with capacities of up to 3TB are increasingly available for less than \$200

website at <http://tinyurl.com/ka8f7lj>.

As simple as it is to set up, there are major downsides to relying solely on an external hard disk, not least the lack of protection for your data. That single external disk now holds the only copy of much of your media collection, so it's vulnerable to disk failure, theft or damage. There are several additional solutions - such as also sending your files to the cloud or network drives, both of which we'll come to - but you could simply buy two external disks and set one up as a duplicate of the other.

Windows has a built-in utility for this: in Windows 7, it's called "Backup and Recovery", but in Windows 8 you'll have to open the Windows 7 File Recovery tool from the control panel and click "Set up backup". From there, you can choose your destination drive - the second of your two external hard disks - and choose the files you want to back up, which will be the media collection you just copied onto the first drive. Choose a regular time and day to perform the backup, and that's it; just make sure you have both drives plugged in at the right time, or the backup will fail.

TRUST THE CLOUD

Data loss shouldn't be a problem for our next option. Storing files in the cloud has never been easier: generally, it takes a quick sign-up and a few clicks to select the folders to include. It's never going to be a fast solution, with the initial upload potentially taking hours or days on an ADSL broadband connection, but once it's up there, it's backed up and safe from harm - hopefully.

However, actually using the cloud for our needs requires several different accounts on several different clouds. We're not looking for a simple online backup, ready to be restored should anything go wrong; we want an accessible collection of music, videos and other files, so we can keep using our computers like we did before we made the step up (and down) to an SSD.

You're well covered when it comes to storing music. Apple was first to realise its phones didn't have the storage to match people's collections, so it launched iTunes Match; for \$35 per year, this service will scan your library, convert every matched track to a 256Kbits/sec AAC file and make them available online via any iOS or iTunes-compatible device. The limit is 25,000 tracks, enough even for a heavy user. Amazon's platform-agnostic Cloud Player Premium will match 250,000 tracks for the same price (just be aware that, while some functionality is accessible, the service isn't officially available here in Australia), but neither service can top the value of our personal favourite of these services, Google Play Music: it matches 20,000 tracks for free.

These services are ideal for offloading the storage of a large music collection to the cloud, and they're effortless to set up and use. Just bear in mind that access is tied to your subscription, in the case of Apple and Amazon; make sure you redownload your entire collection to local storage before you cancel.

There are so many options to choose from for storing documents. Depending on your platform preference, you could make use of the free storage

► Synology's DS213air NAS device offers Gigabit Ethernet and 2.4GHz 802.11n Wi-Fi



services offered by Google Drive, Microsoft SkyDrive or Apple iCloud, all of which come with extra features such as online editing and calendar syncing. None of them can match the cross-platform simplicity of Dropbox, however. Sign up for the free 2GB account, then perform some simple setup tasks for a further

"Jolidrive gathers everything you store in the cloud into one clean browser interface"

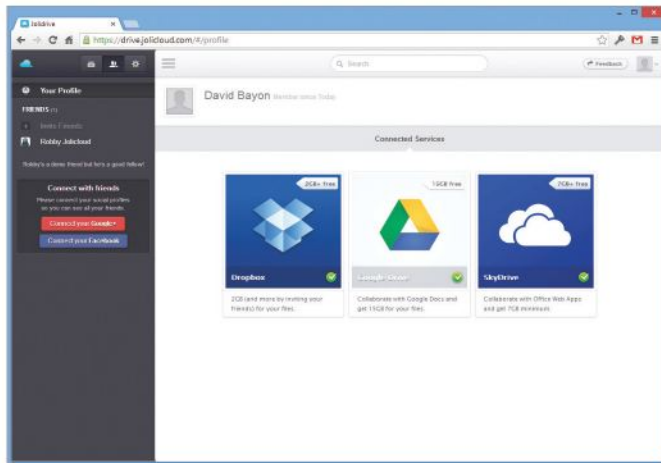
500MB; referrals and photo uploads can boost that to as much as 18GB.

To maximise value, make use of multiple free storage services at once. That might sound like a pain, but the free Jolidrive (www.jolicloud.com) does an impressive job of gathering everything you store in the cloud into one clean (although read-only) browser interface. It currently supports Box, Dropbox, Google+, Google Drive, Facebook, SkyDrive, Ubuntu One and several media services, such as SoundCloud and Flickr, with more promised.

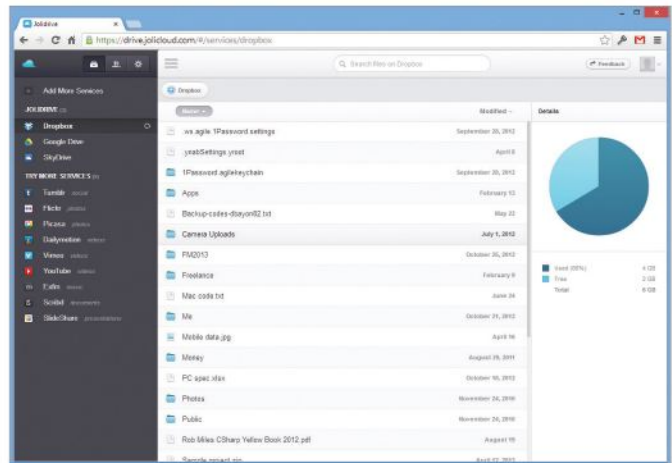
The one gaping hole in our cloud-storage strategy is video. There's no video equivalent to the various music-match services, and the kind of capacities required means you're going to have to shell out a monthly or annual fee to upload and stream such large files to a storage service. Many good video-streaming solutions are available, but they don't actually store the files - you still need a hard disk from which to stream. For heavy users, local storage still wins out, which brings us to our final option.



▲ SSDs are much faster than mechanical disks, but they're significantly more expensive



▲ Jolidrive gathers your disparate cloud files in one clean browser...



▲ ...and it supports the likes of Dropbox, Google Drive and Flickr

NAS DEVICES

Network-attached storage (NAS) gives the best of both worlds: the capacity of local storage with the freedom of the cloud. A NAS has huge advantages over a simple external hard disk. It can store and serve up different files for multiple users; you can mirror your data to safeguard against disk failure by using multiple disks in a RAID array; and today's NAS devices can host shared printers, support IP cameras, and stream media to compatible devices on the network or over the internet. Wherever you want access, a NAS is your always-on media provider.

The downside of using a NAS device is that it must be switched on and connected to the network at all times, which means noise, heat and a steady flow of cash onto your electricity bill. If your router is in the living room and your NAS is Ethernet-only, there isn't much you can do except run a long cable to house the device in a less-used part of the house.

Happily, more and more NAS devices offer Wi-Fi connections, and they're also getting steadily quieter and more power-efficient. For example, the Synology DS213air, has both Gigabit Ethernet and 2.4GHz 802.11n wireless.

This helps with more than only placement. You can connect directly to

the device's Wi-Fi and set up your disks however you want them, without running any setup software on your PC or laptop first. You can even use the DS213air as a wireless router, albeit a fairly basic one.

As for performance, you won't quite achieve the speeds of a direct connection to a USB 3 external hard disk, but a good NAS device won't be far off. When we tested the DS213air, we measured a peak transfer speed of 71MB/sec over Gigabit Ethernet, which is almost twice as fast as our test USB 2 drive. Of course, if you set up your NAS to connect wirelessly, you're sacrificing performance for the sake of convenience: we copied files to the DS213air at 13.2MB/sec at close range, which dropped as we moved to other rooms in the house.

The biggest strength of a NAS device, however, is one that no other home storage solution can match: a huge capacity that's always ready for use. All good NAS devices work as iTunes and DLNA-certified media servers for easy streaming to a huge array of connected devices; either use the bundled software, or direct iTunes or another utility towards the media folder on your NAS. Other features can include integrated Eye-Fi support - which allows supported

cameras to send photos directly to storage via Wi-Fi - connections to sites such as Flickr, a BitTorrent client for downloading without a PC, and even mobile apps to access files on the move. Many NAS devices also allow remote access from anywhere with an internet connection, which is great for travelling users.

So, what's the catch? If NAS devices are now so simple to set up and offer such a convenient experience, why aren't we all using them?

The main reason is the cost. The Synology DS213air will set you back around \$350, and that's diskless. Wired alternatives are available for less, but you won't find many two-bay diskless NAS devices for less than \$130.

We are starting to see drivesthat bridge the gap between NAS and external HDD though, Western Digital's just-launched My Cloud drive aims to provide NAS-like functionality from an ethernet drive built around ease of use for the less tech-savvy.

TAKE YOUR PICK

Before you choose a storage solution, you should know just what it is you want to achieve. We're not talking about backups, but rather potentially splitting an extensive media collection across multiple locations, so that your SSD has to hold only the necessary basics - perhaps a manageable slice of your music and video collection, plus core software and files for daily use.

Also, bear in mind, that the best approach may not be one of the options in this feature, but rather a combination of all three. It may seem counter-intuitive to split your data, but the convenience of the cloud makes it simpler in practice than it sounds.

So, with whatever hardware you have to hand, and plan the rest based on the size of your collection, your needs - and your budget. ■

STORAGE SOLUTIONS: THE PROS AND CONS

	PROS	CONS
External hard disk	Affordable to buy/cheap to convert existing disks Simple to set up Consistently fast transfer speeds	Single point of failure Must be manually updated Not ideal for multiple users
Network storage	Data redundancy Huge capacities Always up to date Streams to anywhere Easily supports multiple users	Expensive to set up Continuous power draw/noise Requires intermediate technical skills
Cloud storage	Convenient Always up to date, backed up Cheap or free Ideal for music/documents	Requires internet connection Higher capacities can be expensive Slow uploads, variable downloads

Synology®

NEW

DiskStation DS214play

Your Ultimate Media Center



Optimised for multimedia processing, the new DS214play fulfills your needs for high-quality photo, music and video streaming, while keeping all other aspects of NAS uncompromised. It features 1080p full HD video transcoding on the fly to let you watch HD movies smoothly via DLNA and AirPlay. Running DSM 4.3, the DS214play is your versatile and easy-to-use private cloud, where you can access data from anywhere.

Distributed by



Accolades for Synology



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Is Facebook safe for business?

YOUR BUSINESS SHOULDN'T RELY TOO MUCH ON ONE SOCIAL NETWORK, WARNS **DAVEY WINDER**, OR IT COULD BE HEADING FOR FAILURE

You probably thought I was going to start another rant, from an IT security perspective, about the dangers of using Facebook within a business setting, didn't you? However, in posing the "is Facebook safe?" question on this occasion, I actually mean it more literally - should you be doing business on Facebook? The shallow answer is also the obvious one, and that's a resounding yes. In fact, I'd go further by saying that you'd be daft not to be exploiting social media wherever possible in order to promote your brand and build a true customer community. Nevertheless, if you dig a little deeper then the answer to the question becomes less clear-cut, as software developer Matt Kruse has discovered to his cost.

Kruse is the man behind Social Fixer, which is an absolutely essential add-on for any Facebook user in my never-humble opinion. Regular readers may recall how earlier this year I waxed lyrical about changing the frustrating Facebook user experience by installing his free JavaScript app (web ID: 381892), which runs inside your web browser to make Facebook's UI more customisable. Truth be told, I'm not even sure I'd still be using Facebook were it not for Social Fixer, since the app lets you make the ever-changing UI "usable" once again. I'm not alone here, either, given that over the four years that Kruse has been pushing his free application it's garnered half a million users.

Now you may think that Kruse proves my point above, since he's managed to build a very successful business (although he still refers to it as his personal side project) based in and around Facebook. His Facebook page for Social Fixer had close to 340,000 likes, which isn't bad going - or to be more precise, wasn't. I use the past tense here for a reason, because Facebook closed down his Social Fixer page - which Kruse used for support and passing news of new developments to users - without any notice, early in September.

Don't panic if you haven't tried



“Social Fixer is an absolutely essential add-on for any Facebook user”

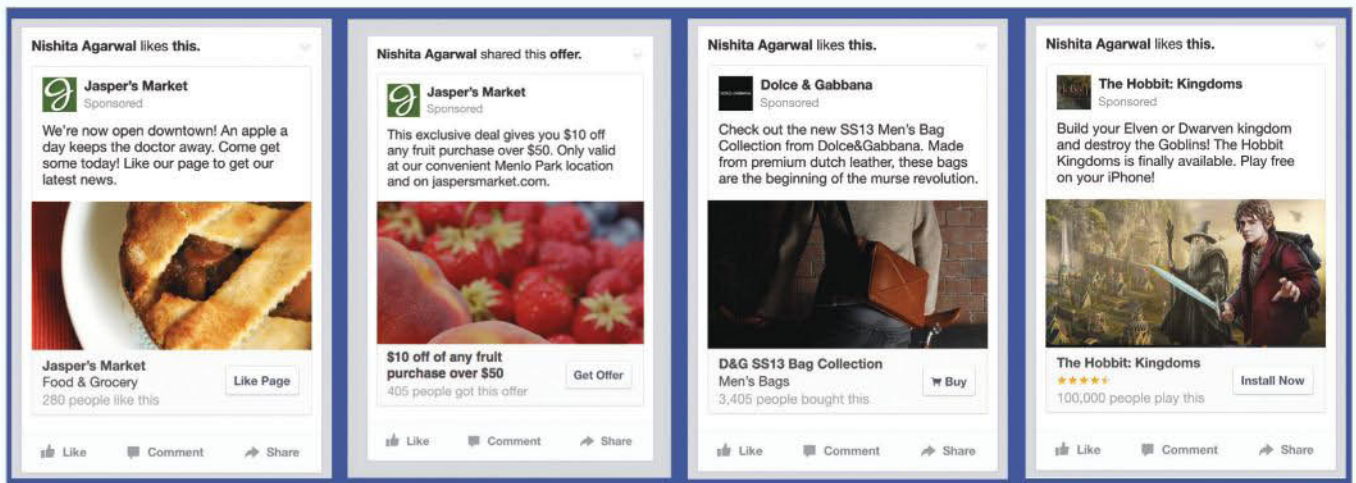
Social Fixer yet, because the app itself is still available from <http://socialfixer.com>. Facebook has killed off only its community page on the social network, not the actual application. Of course Facebook could attempt to do that too if it really wanted, although I'm not sure how easy it would be: Social Fixer works within your local browser to customise the way it displays the Facebook interface, and therefore it doesn't interfere with server-side Facebook at all.

Even so, some commentators have jumped to the conclusion that this was the reason behind the pulling of the Social Fixer support page: they claim it was only a matter of time, since it says quite clearly in the Facebook "Statement of Rights and Responsibilities" that: "You will not do anything that could disable, overburden, or impair the proper working or appearance of Facebook, such as a denial-of-service attack or interference with page rendering or other Facebook functionality." There's no denying that Social Fixer does interfere with page rendering at the client end, since that's precisely what it was designed to do.

Kruse insists that since his software isn't an official app, and doesn't

employ the Facebook API, and he isn't a registered Facebook developer, that he can't reasonably be expected to be bound by the terms of service put in place for API developers. What's more, he's also insistent that the clause in question is quite clearly aimed at malware and spyware. Any interference with page rendering shouldn't alter the way those pages appear to others, not to an individual user inside their own browser. Kruse goes on to argue - with a lot of common sense, in my opinion - that if Facebook wished to broaden this condition to outlaw any interference by the individual at the client end, then anyone who changes the font size (that's me folks, as my eyesight is too poor to read normal-sized text), or deploys custom styles for readability (me again), or enlarges the screen (hello!), would be in breach of it. That's just daft - take such a condition to its absurd conclusion and we'd have to jump back 20 years to the days when AOL and CompuServe ruled the roost, with proprietary browsers that wholly dictated what your user experience could look like.

Nope, no matter how much Facebook might wish it otherwise, the fact of the matter is that the user has the



right to tweak how any web pages are displayed in their browser of choice. "Social Fixer runs in your own browser, and tweaks the display on your behalf, because you asked it to," says Kruse. "This does not violate any terms of service."

So what reason did Facebook give for closing down the Social Fixer community page? Initially, Kruse was unsure, because all he was told was that his page was "in violation of community standards", although he later learned that it had been removed as it had been flagged as "content containing spam". This is bizarre, since it was used to provide support and news to users who had already liked the page - all 340,000 of them - and who had therefore consented to being given this news. At the time of writing, Facebook remains tight-lipped about the whole case and has yet to respond to enquiries by Kruse asking for a more detailed explanation.

Ultimately, I'm not sure it really matters, but I do wonder whether this just serves as another warning to any business that plans a big investment in social media right now: sit back and carefully examine your strategy to ensure you're not putting yourself in danger of being run over by a single-point-of-failure (SPOF) bus. The particular bus I'm thinking of is an enterprise service bus (ESB), which is often cited in networking tutorials as a worrying example of a potential SPOF. If all your services are connected via this ESB and if this ESB goes down, there can be no communication between clients and services: that SPOF could close down your entire network - albeit temporarily - until it's fixed again. Equally, if you've built your business or your social media strategy around a single network such as Facebook, and

▲ Facebook can destroy your social media strategy in a heartbeat

A savvy business needs to be spreading the risk to avoid a single point of failure



DAVEY WINDER
Award-winning journalist and small-business consultant specialising in privacy and security issues.

that network decides to pull the plug on you - for whatever reason, good or bad - then it's become a SPOF with potentially costly implications.

With increasing numbers of businesses choosing which social network to invest time and money into based upon the size of that network, its customer profile, interface issues and so on, it's rather easy to lose sight of the wood for the trees. Instead of putting all its social media eggs into a single basket, a savvy business, of whatever size, needs to be spreading the risk to avoid a SPOF bus crash. At the very least, any social media strategy should incorporate a contingency plan to mitigate the impact of a failure such as Facebook closing you down.

For the record, Kruse did have such a contingency plan. Although his Facebook page was - understandably enough for a piece of software that's only of use to Facebook users - the central means of communication with his customers, it wasn't what you might call a critical dependence. Not only does Social Fixer continue to work just fine without that page, but the software checks on the development company's servers for important messages and displays them onscreen for users anyway.

This isn't an avenue that Kruse had used much in the past because he preferred the Facebook page option, ironically enough - given that he stands accused of spamming - because it was less intrusive on the user...

PAY TO SHOW?

I know there's a glib answer awaiting me whenever I criticise Facebook, Twitter or any other "free" social networking service, namely that you get what you pay for. This is fair enough, but surely it isn't too much to

expect even a free service (especially one the size of Facebook, and with such a vast resource pool of developers and cash to draw upon) to get the basics of usability right?

Case in point: whenever you like a page or group on Facebook, you assume - or at least I assume - that you'll get to see everything that's posted upon that page. But think again - we're in the land of insane user interface implementations here. To actually see everything that's posted to that page, you have to first hover over the "Like" button, click on Settings and then change its default setting from "Most updates" to "All updates". This prompts a couple of questions in my mind, quite apart from the obvious "what does Facebook think it's playing at". First, why would Facebook default to not showing everything on a page? And second, how does it choose what to show you? Is this just another case of more UI stupidity from the gods of moronic UI design, or perhaps something a little more sinister?

When I mentioned this to *PC&TA* colleague Paul Ockenden, he suggested that it comes back to the money thing: "page owners can pay more to pump out more of their updates". In other words, you get to see as much as they've paid to show. This makes sense if you're Facebook looking to find a way to generate revenue from the free behemoth it's created. However, if I've created a page or group, then I rather assume that anyone who likes it will get to see everything posted to it, and if I've liked such a page, I don't want what I see to be at the mercy of an arbitrary algorithm deciding what's important and what isn't.

So, here's a simple solution: if you're setting up a Facebook page or group, in a business or personal capacity, make sure you pin a nice clear post right at the top explaining how users can see

everything that's posted via a couple of mouse clicks. This way your readers will get to see everything and you won't have to pay Facebook anything...

TAKING A BITE OUT OF APPLE'S BIOMETRICS

I don't usually stray into the area of smartphones in this column, but the release of the iPhone 5s with that fingerprint reader is too good an opportunity to ignore. Not least because - whatever your feelings about Apple and iPhones - this simple implementation is likely to give biometrics the consumer kick-start it's needed for a long time. It's fair to say that biometrics in general, and fingerprint scanning in particular, is about to hit the mainstream.

It's also fair to ask - and plenty of people have been doing just that - how secure mobile fingerprint readers are, and what the privacy implications are in the light of Prism, NSA databases and the like. Within days of Apple announcing the new iPhone 5s, and demonstrating the fingerprint reader, the backlash started. First it was a funny video of a young girl using her sleeping father's finger to access his iPhone, and then it was another showing a cat accessing an iPhone with a paw-print. Both funny, but neither of any real-world interest when it comes to a security debate. Of more concern is a crowdfunded reward for the first person to hack the fingerprint reader, and claims that have emerged that a "cloned" and scanned fingerprint lifted from a trace print left on a surface can be used to fool the reader. But how much of a concern are these things?

Let's get the most important point out of the way immediately: fingerprints aren't 100% secure. There, I've said it, although you really should have known it already. Just as passwords aren't 100% secure, and neither is anything else. There are only degrees of security, and that's what the whole iPhone biometrics debate should be focusing on. When the Chaos Computer Club in Germany used an old method of cloning a fingerprint

“

A fingerprint is more secure than an often easily guessable PIN, and better than nothing

”



We Removed Something You Posted

We removed this from Facebook because it violates our Community Standards:



Social Fixer



Continue

first published back in 2004 it came as no great surprise, but no great concern either. Sure, it can be done, if the attacker has access to your phone and to a photograph of your fingerprint at 2,400dpi, which can be inverted and laser-printed at 1,200dpi using "thick toner" onto a transparent sheet, then lifted off using a pink latex milk solution.

I'm not sure anyone would want to go to quite that level of effort to access my iPhone, nor the data that could be unlocked once access was gained - anything important on my device, and in the cloud beyond, is nicely encrypted, thanks very much, and the passwords to unlock it are long and complex.

A fingerprint is more secure than an often easily guessable PIN, and unarguably better than nothing at all, which is the state a huge percentage of iPhone users' handsets are in all the time. It's about usability, and this level of usable security is about right for a smartphone, for the majority of people using one. If the secrets on your phone are valuable enough to render it inadequate, then you really shouldn't be carrying them around in your pocket in the first place. Anything that makes a user more likely to implement a layer of security (and the easy-to-use fingerprint scan will do just that) gets my blessing.

Not least since the reader itself, and the Touch ID system built around it - which came about after Apple bought AuthenTec - is actually pretty well designed. There's no swipe gesture for a start, just a press and hold, which makes the chances of instant

recognition far higher. It isn't even as if the biometrics are being used as the only method of authentication for iPhone users - they're not. You'll still need your password/PIN if your fingerprint scan fails three times, if the iPhone hasn't been used for 48 hours, or if it's been rebooted.

As for this whole NSA database issue, I'm not convinced. The one-way hashed fingerprint data will be stored locally on your iPhone in a secure section of the A7 chip, using an encrypted template calculated from the initial scan. Developers aren't being given access to the Touch ID system to work into their apps. Websites won't see your prints, either; only a message telling them they match okay if used to pay for something on iTunes. In essence, the part of the A7 chip storing your fingerprint data is secure and will pass nothing but a yes/no response to any external request. iTunes asks if it's okay to authenticate a purchase and the chip says yes or no, that's all.

If the NSA or government wants your fingerprints, there are far easier ways of getting them - you give them up when you fly to the US, as just one example. So don't start thinking of your new iPhone, should you get one, in James Bond terms, because the reality is much duller. The biometrics are a backup and shortcut to your password/PIN, not a replacement. And if you lose your phone, you should still nuke it using the Find My iPhone app to be on the safe side. ■

GOING SOCIAL

According to new research from YouGov, 47% of companies have now adopted social-collaboration technology. The appetite for Facebook-alike social networking tools within the enterprise can, the survey says, be put down to flexible working, remote working and the falling cost of this technology.

Input Output



DAN RUTTER BRINGS THE ANSWERS TO YOUR QUESTIONS LIKE NO-ONE ELSE CAN

ENHANCE!

I I'm using an - I believe you call it "yum cha" - unknown-brand LCD TV as a monitor for my living-room computer. The TV has analogue component inputs and two digital inputs, one HDMI and one DVI, and it even came with an HDMI cable, so I plugged it into my PC with that and the picture was... terrible. Sort of skinny halos around everything, and weird colours, and a sort of blurring effect on moving things, right down to the mouse pointer.

My computer has a DVI output too so I got a DVI cable and tried that, and it looks fine now. Viewing angles still not so great, but it was really cheap so I'm not complaining.

I thought the video signal for DVI and HDMI was the same, though, except for DRM and the possibility of audio as well on HDMI. Why do they look so different?

C. Brewis

O Most modern flatscreen TVs have "image enhancement" functions which do, arguably, make some TV and movies look better. Your haloing effect probably came from sharpening, for instance, and colour strangeness could be the result of punched-up saturation and contrast, that psychedelic super-saturated look that TV shops often use to catch customer attention. The blurry weirdness could be interpolation meant to boost the apparent frame rate and reduce flicker.

These sorts of features are often turned on by default when a TV thinks it's displaying television or movies, which is what your TV presumes HDMI input to be. It presumes DVI input to be from a computer, and doesn't use any of the enhancements then.

If you've got a screen that looks better with *analogue* input ("VGA", or even component cables) than with HDMI, this is probably the reason. You can probably also turn off all of the enhancements for HDMI, but I wouldn't bet on that

being possible on the cheapest and most cheerful of TVs.

I, ALSO, LIKE TO LIVE DANGEROUSLY

I Can you charge a lithium ion battery without a proper charger, by just connecting a power supply of appropriate voltage to the correct terminals with paper clips and alligator clip leads and other such things? I've seen something like this done with a bench power supply at uni, but I don't know how dangerous it is, or isn't.

Ruby M.

O Yes, you can do this, and it can get you out of trouble if there's no other way to charge your laptop or phone or whatever. But it can also get you *into* rather more trouble. This is one of those situations where asking the question means you probably don't have enough experience to try it unsupervised.

Some "smart" batteries have internal hardware that won't allow them to charge, or even discharge, unless the right things are connected to the extra terminals that many rechargeable lithium batteries have in addition to the simple positive and negative.

A bench power supply can easily be adjusted to deliver a battery's charged voltage, and most bench supplies also have current limiting. Careful application of these two

▼ Rare-earth magnets make it easy to connect a battery to something you shouldn't connect a battery to!



features will make it difficult to *quickly* explode a lithium battery.

An explosion is still eminently possible, though, because a bench supply has no idea when the charge should be stopped. The safest thing to do is to wind the current limiting way back, and set the voltage to something below the normal charged voltage of the battery, but above its current un-charged terminal voltage. This makes it impossible to charge the battery too fast, or overcharge it at all. You'll never fully *charge* it, either, but this is good enough for throwing a 20% charge into your phone battery so you can make a couple of calls, or whatever. You can do this with lithium-ion and lithium-polymer batteries, and all other rechargeable chemistries - nickel metal hydride, nickel cadmium, lead acid.

If you're using something other than a bench supply, you can still stay reasonably safe if the voltage of the power supply you choose is appropriate to the thing you're charging. You can, for instance, probably get a useful charge into a flat 12-volt car battery by hooking it up to the 12V output of a PC power supply. What's highly inadvisable is quick-charge techniques where you deliberately connect a battery to a high-current-capacity source with a substantially higher voltage than the battery should have even when fully charged.

Example of this from the olden days: Connecting a 7.2-volt model-car battery pack to a 12-volt car battery to charge, with only a resistor in the "charge cord" standing between the user and a burnt-out car. Example of this from today: Connecting a single-cell 3.6-volt phone battery directly to 5-volt USB power.

Shorting things out is an ever-present danger when you're doing this sort of hackery, too. Some lithium batteries will get hazardously excited if shorted, many have some kind of protection cutout mechanism that temporarily or permanently disconnects the output terminals if they're

overloaded. Every proper bench power supply is short-circuit protected. Car batteries, not so much.

These sorts of tricks should only be attempted if you're in a real survival situation. Because then, if the charge fails, you may at least have successfully started a campfire!

INSERT PLUG A INTO HOLE B WITH CLUB-HAMMER C

I The rear ports on the motherboard of my PC don't line up properly with the holes in the metal cover at the back of the case, I think because the case itself isn't quite square. I can just about jam the USB and audio plugs in, but the network and PS/2 keyboard sockets have required me to prune a little plastic off the plugs.

I notice that the metal cover is a separate piece, not part of the main chassis of the case. Can you just remove it and leave the ports "nude"? Or is that a bad idea because of shielding or earthing or something?

Aaron Connolly

O Yes, you can just pull the port plate off and discard it. (If you don't care whether it survives, you could probably grab it with pliers and yank it straight out through the hole it sits in, without even taking the side off the case. All usual disclaimers about computer destruction occurring because of my idiotic advice apply.)

The cover is there partly for airflow reasons and partly, as you say, for RF shielding, but just making a hole that size in the back of the case is very unlikely to cause interference problems for anything. Computers that exceed quite strict RF interference standards are illegal to sell, but even a completely nude PC built on a plastic frame isn't likely to cause interference beyond messing up AM radio reception within a couple of metres.

Note that misaligned components in a PC may indeed be that way because the case is just a bit wonky, as many cheap PC cases are. But it's also possible that there's some gross problem like a motherboard in trace-snapping tension because its mounting standoffs are different lengths, or a lever gadget that's meant to hold large video cards in place but is instead pushing the card to one side and trying to lever that slot off the motherboard.

Fixing a problem like that should cause everything to line up nicely again without requiring you to discard any pieces of the case. It can also protect you from sudden damage to your bank account.

WANTED: SERIES OF TUBES

I What's the easiest way to map a network drive over the Internet? Home-workers in my small company need to be able to access stuff on what passes for a server here (it's still running Windows XP), and really just one simple shared folder would do it, with a bit of security but no need to go nuts. We're not a big target for industrial espionage or international spy agencies.

I've tried Remote Desktop and Google cloud storage, but the boss says and I agree that just mapping a damn drive will do just fine if we can find some easy way to do it.

I do not, very not, very strongly

not, want to have to teach my travelling co-workers how to open ports on a router.

Any clues?

Patrick Short

O Use Hamachi (bit.ly/logham). It's specifically made to allow you to create an ad-hoc virtual private network (VPN) without messing around with router config, it works on WinXP, and it doesn't even cost money unless you want more than five devices connected.

Hamachi isn't going to give you 99.9999% uptime, ping times across the network from Australia probably won't be great, and I wouldn't trust its security with my plans to destroy NATO with this weather machine I'm building. But it looks as if it'll do what you want.

IF YOU HAVE A QUESTION FOR DAN RUTTER, SEND HIM AN EMAIL AT IO@ATOMICMPC.

I/O OF THE MONTH

"CLICK HERE TO NOT REFUSE NEGATIVE NON-INSTALLATION OF ULTRA REGISTRY BONZIBUDDY!"

I Suddenly I have "McAfee VirusScan" on my computer (Windows 7 x64). I did not install it. So what I'm thinking is that it's some kind of virus that's pretending to be a common antivirus program. It doesn't seem to be doing anything bad, though, and I can't find anything online about such a program, though there are lots of other "fake antivirus" malware things.

Am I being too paranoid?

Sean Horne

O You probably did install it. You just didn't mean to.

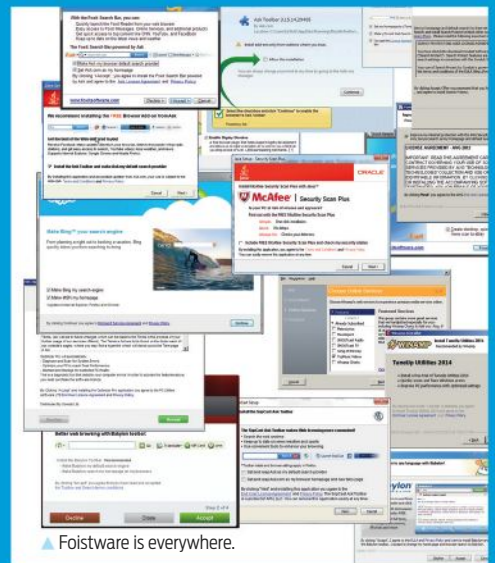
You know those irritating programs with an installer that has five extra pages in it that say "Install SuperWhizBang Toolbar" and "Sign up for 1050 free MP3s from DodgyTunes.ua" and so on? Sun have been playing these "foistware" tricks with the standard Java installer for years. At the moment it installs a McAfee antivirus thing, unless you tell it not to.

If you're lucky, a sneaky installer like this will only change your default search engine or something. The next rung up the foistware nuisance ladder are high-useless toolbars. Next come real but unwanted apps, like the McAfee free gift you're so delighted to have received. Then there are semi-spyware things like the "Search Protect" program

that recent uTorrent versions install even when you say you don't want it.

Foistware isn't malware, strictly speaking; what's being foisted on you is something that you could imagine some person actually wanting, unlike actual viruses and fake antivirus programs and so on. And yes, money from foistware does help support small software companies that know most users will never buy the commercial version of whatever it is they make.

Microsoft and Adobe do it too, though, and I think they could probably afford not to.



DVD CONTENTS

GAMES, ESSENTIALS, FULL SOFTWARE, DRIVERS & MORE!

Each issue, we aim to provide all *PC & Tech Authority* readers with a full suite of simple yet important applications, along with a variety of extended trials and full programs that are both useful and interesting.

This month, we've put together a range of productivity applications, making this disc an awesome way to get set up for image editing and document creation. We also have our regular selection of security apps and much, much more.

Oh, and we've got the demo for the amazingly entertaining *Marvel Lego Heroes*, which combines two of our very favourite things – give it a go!

Plus we have the handy *Tails Linux OS*, which you can run from a USB drive or DVD.

Complete Home Productivity Special



Libre Office

LibreOffice 4.1 is the most recent stable version of our software and marks a major milestone for the LibreOffice project.

LibreOffice comes with a host of new features for its users as well as several important changes and improvements under the hood. Below are some noticeable changes brought by this version and you can get the full list in the release notes.

COLLABORATE WITH OTHERS

LibreOffice now integrates with Content Management Systems and online document storage via the CMIS standard. This allows

you to access directly documents stored on ECM systems, be they Open Source, like Alfresco or Nuxeo, or proprietary, like Microsoft SharePoint.

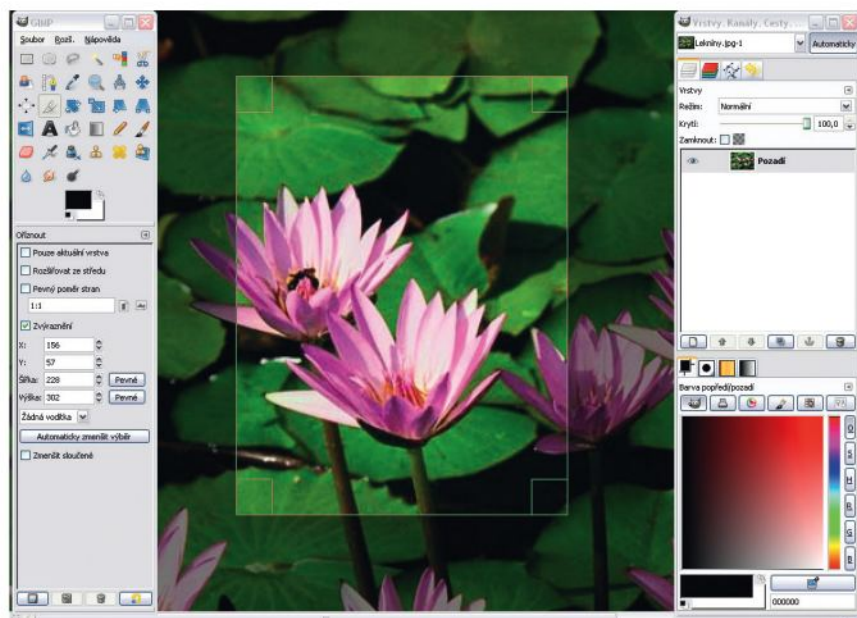
THEME YOUR OFFICE SUITE THE WAY YOU LIKE!

Make use of Firefox's personas to make your LibreOffice even more personal! Personas (now renamed "Firefox themes") are background images to embellish your user interface: thousands of them have been made available by the Firefox community and creating your own is a breeze.

GIMP

GIMP is an acronym for GNU Image Manipulation Program. It is a freely distributed program for such tasks as photo retouching, image composition and image authoring.

It has many capabilities. It can be used as a simple paint program, an expert quality photo retouching program, an online batch processing system, a mass production image renderer, an image format converter, etc.



DID YOU KNOW?

You can find a guide to using ISO files in the Editorial section of the DVD

GIMP is expandable and extensible. It is designed to be augmented with plug-ins and extensions to do just about anything. The advanced scripting interface allows everything from the simplest task to the most complex image manipulation procedures to be easily scripted.

GIMP is written and developed under X11 on UNIX platforms. But basically the same code also runs on MS Windows and Mac OS X.

Scribus



Scribus is an Open Source program that brings professional page layout to Linux, BSD UNIX, Solaris, OpenIndiana, GNU/Hurd, Mac OS X, OS/2 Warp 4, eComStation, Haiku and Windows desktops with a combination of press-ready output and new approaches to page design.

Underneath a modern and user-friendly interface, Scribus supports professional publishing features, such as colour separations, CMYK and spot colours, ICC colour management, and versatile PDF creation.



▲ Marvel Lego Superheroes

All you need to know about this game: Avengers, X-Men, Lego. GET PLAYING!



DVD CONTENTS

No 194 / January 2014

WINDOWS • 7Zip • CCleaner • CutePDF Writer • Defraggler • Foxit Reader • Apple iTunes • Malwarebytes Anti-Malware • Open Office • Sandboxle • Songbird • Spybot Search & Destroy • Teracopy • VLC Media Player • WinRAR • WinZip • Avast Free Antivirus • AVG AntiVirus Free Edition 2011 • PC Tools AntiVirus Free **INTERNET** AOL Instant Messenger • Vuze • Google Chrome • Dropbox • Feed Reader • Filezilla • Internet Explorer • Microsoft Security Essentials • Mozilla Firefox Mozilla Thunderbird • Skype Steam • ZoneAlarm • **DRIVERS** ATI • Nvidia • Direct X • Realtek Audio Codecs • VIA Hyperion Drivers **FEATURE** Adaware Free Antivirus+ • Lego Marvel Super Heroes • Libre Office • GIMP • Scribus • Lightworks • Blender • Inkscape • Audacity • Picasa • Paint.NET • Virtual Dub **EDITORIAL** Burning an ISO Image

INSTRUCTIONS: Open Windows Explorer, navigate to your DVD drive and double-click Index.html in the root directory. **DISC PROBLEMS:** To replace faulty DVDs, please send the discs to: PC&Tech Authority DVD Replacements, R50 Victoria St, McMahon's Point NSW 2060

Make sure to include your name and postal address on the back of the package so that we know where to send the replacements. For all other DVD related issues email cd@pcandtechauthority.com.au. As the delivery platform only, PC&TA and Haymarket Media cannot and will not provide support for any of the software or data contained on these discs. Although all discs are virus scanned, Haymarket Media cannot accept any responsibility for any loss, damage or disruption to your data or computer system that may occur while using the discs, the programs or the data on them. There are no explicit or implied warranties for any of the software products on the discs. Use of these discs is strictly at your own risk.

Get to grips with tables of contents

ARE TOC FORMATTING TROUBLES DRIVING YOU MAD? **SIMON JONES** EXPLAINS HOW TO AVOID THE MOST COMMON ERRORS AND USE STYLES WITH SUBSTANCE

One of my regular correspondents, Leonard, emailed me recently to ask for help with problems he's been encountering with a table of contents (TOC) in Microsoft Word:

"I have a document that was working fine until the other day. I made a couple of changes to one of the texts to be included in the TOC, then hit F9 and checked Update Entire Table. Boom! Instead of the text in the table being 14pt, it's now 20pt. I suspected that the change in point size was due to the fact I inserted a 20pt right before the TOC. However, I tested this by inserting a TOC on a fresh page at the end of the document and it's still 20pt. I even fiddled with the setting in the "Insert Table of Contents" screens to make sure 14pt is specified - to no avail."

This issue - namely that manual formatting applied to a heading appears in the TOC when you don't want it to - seems to be a common problem. Manually adjusting the formatting of one TOC entry can affect all the others, too. For example, if you highlight text in a heading and colour it green, the TOC entry that points to that heading may take on the same colour when you update the TOC. If you manually set a heading to be centre-aligned, its entry in the TOC may also show as centred, and fixing this glitch can mess up the entire TOC. This is one of those all-too-frequent situations where Word does what you want before suddenly, and for no apparent reason, refusing to play ball.

By manual formatting, I mean all formatting that isn't set by applying a style. This includes all character and paragraph formatting that you apply from the menus, toolbars, ribbon buttons, context menus or shortcut keys, such as Ctrl+B for Bold, Ctrl+L for Align Left and so on. If you apply manual formatting to your headings and TOC, it may look correct, but it will be a mess behind the scenes. For instance, if you centre a heading then justify the whole of the TOC, the table might look okay at first, but updating the TOC may actually remove all your manual formatting.



SIMON JONES

An independent IT consultant specialising in Office Automation, Visual Basic and SQL Server.



Clearing the manual formatting from the affected regions and consistently applying new formatting with styles will give a cleaner, more stable result.

If special formatting is required for a particular heading, create a new style based on the appropriate heading level and change the formatting in that style, rather than adjusting the text manually. You can then apply that style to the heading or headings you want to change without affecting the TOC.

WHAT IS A TABLE OF CONTENTS?

A table of contents in Word is implemented as a field - that is, a special code that tells Word to show links to other parts of your document. A new TOC is inserted from the ribbon's References tab, where there are a couple of simple, pre-built TOCs in the gallery. Otherwise, if you need special formatting, you can create your own TOCs and save them to the TOC Gallery. If you try inserting a

TOC, selecting all its text and pressing Shift+F9 will toggle its field codes so you can see what it looks like behind the scenes. The default TOC's code will look like this:

```
{ TOC \o "1-3" \h \z \u }
```

The braces indicate a field definition, and "TOC" indicates this is a Table of Contents field. The \o switch is followed by the range of heading levels you want to include in this TOC: the \h switch instructs Word to make the entries hyperlinks to the headings in the document; the \z switch hides the page numbers and dotted leaders in Web Layout view; and the \u switch builds the TOC from the outline levels of the headings.

There are many other switches you can use in a TOC, such as \n, which omits page numbers from some levels, and \x, which preserves newline characters within TOC entries (these would normally be converted into spaces). If you omit the \h and \u

switches, and opt for the \l switch, you can manually mark paragraphs in your text with TC (Table of Contents Entry) fields to have them included in the TOC, much like you might manually mark words and phrases to appear in an index. That said, building a TOC from the headings in your document is generally the easiest and best thing to do.

To toggle back and see the results of your changes, put the insertion point into the TOC field code and press Shift+F9. (You can view a list of all the available TOC field codes at tinyurl.com/6pkcaq7).

A table of contents in Word won't update itself automatically, except when you come to print your document. To update it manually, press F9, or click anywhere inside the TOC; an Update button should appear in the top left. You can choose to update the whole TOC - which will incorporate any headings you've added since the last update that needed to be included in the contents - or only the page numbers.

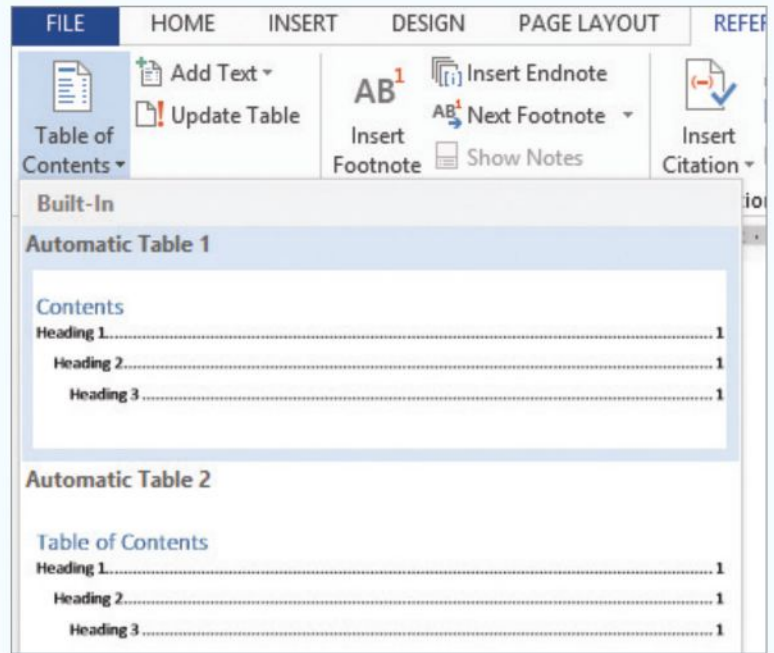
TOC STYLES

Styles TOC1 to TOC9 are used to format all headings of the same level (that is, Heading 1 to Heading 9). TOC1 to TOC9 apply simple formatting, usually in the form of increasingly deeper indents for successive levels, and a single right tab at or near the right margin with dot leaders to indicate the page number.

They won't appear in the Styles task pane (Alt+Ctrl+Shift+S) until they've actually been used in your document, and they don't show up in the Style Gallery at all, since you won't usually want to use these styles anywhere else in a document.

Generally, TOC styles are set to update automatically - that is, any manual formatting applied to one of the TOC entries will be absorbed into the style and applied to all other TOC entries at that level. However,

“ If you need special formatting, create a new style, rather than adjusting the text manually **”**



▲ Pre-built tables of contents can be inserted via the TOC Gallery

this mechanism doesn't always work as intended, and can produce unintended consequences. If you didn't select the whole TOC entry but applied manual formatting, that formatting will be applied only to the portion of the TOC entry you selected, and it won't be promoted to become part of the TOC style, leaving you with one TOC entry that doesn't match the others with the same level/style.

There's an additional style called TOC Heading, which you should use for the heading above the TOC itself. This is based on Heading 1, but it doesn't include an outline level, which means that the table of contents heading will look like a proper heading, but won't be recursively included in the TOC; in other words, it prevents the first entry in the TOC from becoming a pointer to itself.

Similarly, this style won't appear in the Style Gallery, nor will it appear

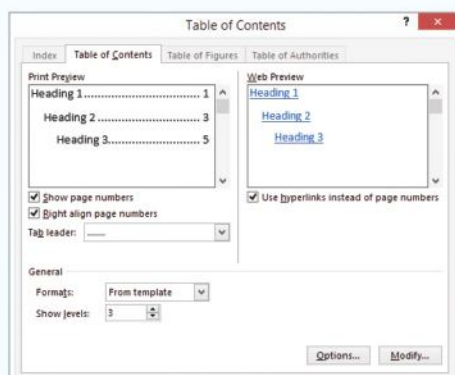
in the Styles task pane until you've created a TOC. Once it does appear, however, you can apply it to any other heading that you don't want to appear in the TOC.

TOC LEVELS

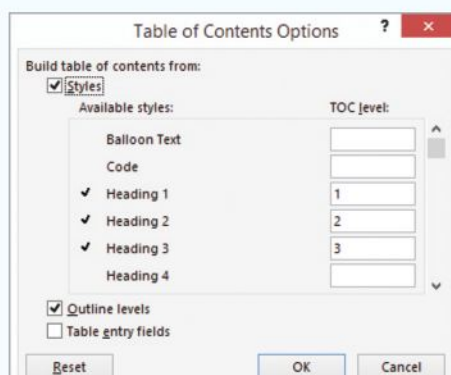
It would be unusual to want to show more than three or four heading levels in a TOC; the default is three. You can edit the number of levels via the field definition for the TOC, or by choosing "Custom Table of Contents" from the bottom of the TOC Gallery on the References tab of the ribbon. This gives you an easy-to-use dialog to insert or update the TOC in your document. The top of the dialog shows you what the TOC will look like in Print Layout and Web Layout views. You can choose whether to include page numbers, whether or not to have them right-aligned, and whether to include dotted leaders.

From the General section at the bottom of this dialog, you can select the number of levels to show in the TOC and pick the TOC style set. The Options dialog gives you even more control over which styles are included in your TOC, which can be particularly useful if you haven't used the provided Heading 1, Heading 2 and Heading 3 styles. You can also turn off the use of Heading styles to drive the TOC and switch instead to adding manual TC fields. The Modify button displays a small dialog that lists styles TOC1 to TOC9 and lets you modify the way these look in your document.

TOC1 to TOC9 are based on Normal style and so use the +Body font,



▲ The Custom dialog lets you control the look and depth of the Table of Contents



▲ The Options menu gives you more control over what's included in the Table of Contents

whatever that's set to in your current document's theme. However, they have different indents for each level, plus the right-tab stop and a dotted leader. These dialogs manipulate the TOC field codes and/or the TOC styles to produce any custom TOC layout you want. It's possible to change the TOC field codes and switches yourself to achieve the same effect, but the Custom TOC dialogs make it far easier.

TOC TRICKS

You can use the Custom TOC Options dialog to remove the TOC levels from the Heading 1 to Heading 9 styles and assign them to other styles you've used in your document.

For example, if you want your Chapter style to become Level 1 and your Section style to become Level 2, you can make those assignments and build your TOC using those styles instead of headings. You can also use the Modify Styles dialog to add outline levels to your own chapter and section styles to achieve the same result.

If your chapter headings are simply numbers, you may prefer the TOC to say "Chapter One" rather than a "1". You can achieve this by inserting a TC field after each chapter number and switching your TOC to use TC fields rather than styles or outline levels in the TOC Options dialog.

To insert a TC field, place the insertion point after your chapter number and click Insert | Text | Quick Parts | Field, or press Alt+N, Q, F. In the Field dialog, select "Index and Tables" from the Categories dropdown and TC from the Field Name. Type the text for your desired TOC entry into the text-entry box and the outline level on the right-hand side. Click OK to insert the field. You shouldn't see anything in the document.

It's possible to insert them manually, but you'll have to show formatting symbols, since TC fields are hidden by default. Press Ctrl+* to show formatting symbols, then Ctrl+F9 to insert a pair of field braces. Next, type "TC "Chapter One" \l 1" between the braces and press Ctrl+* again to hide the field and other formatting symbols. (If you forget to show formatting symbols while you do this, the field will disappear as soon as you type "TC"

within the field braces, which makes it impossible to type the rest of the field definition.)

You can employ second-level TC fields – to add an explanatory text to your TOC – like this:

```
9 { TC "Chapter Nine" \l 1
}{ TC "In which Piglet is
entirely surrounded by
water" /l 2 }
```

In the TOC itself, you can specify the \l and \n switches to include two levels, but omit the page numbers from one of them, like this:

```
{ TOC \l "1-2" \n "1-1" \h \z }
```

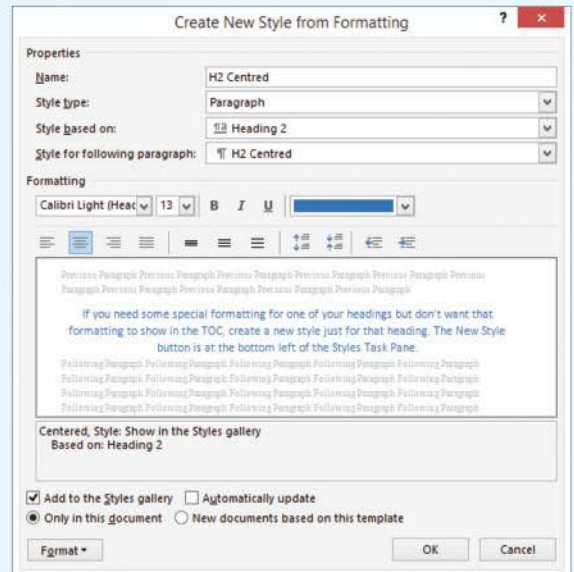
With a little editing of the TOC styles, you can end up with a TOC that looks like the one in the picture below.

Another way to add TC fields is to highlight text and press Alt+Shift+O, which brings up the Mark TOC Entry dialog with the selected text already in it. Choose the level you want and click Mark to insert the TC field. This uses the \f switch that allows you to build different TOCs, each with its own table identifier letter. Use the corresponding \f switch on the TOC to tie it to TC fields entered this way. By default, the dialog uses table identifier C. This feature enables you to put multiple TOCs into your document, to cover features such as illustrations, figures, appendices and more. Simply use a different table identifier letter for each TOC.

EDITING TOC STYLES

The best way to edit TOC styles is to right-click them in the Styles task pane and choose Modify from the context menu. If you rely on manual formatting applied in the TOC to change them, you could scramble the TOC so badly that neither you nor Word knows what's happening any more. If you're already in such a pickle from formatting a TOC, it's often best to delete the entire TOC, clear all the formatting from the area where it will go and then insert a new, clean TOC. This takes only a minute or two and can save you hours of head-scratching.

For the previous Pooh-based TOC



▲ Apply extra formatting using a style based on a Heading

“ Styles won't appear in the Styles task pane until they've actually been used ”

example I used, I made TOC1 bold and TOC2 italic and set them both to have no indents. A common adjustment you may want to make is to change the indents on the TOC styles to make them hanging indents, so that long entries will wrap with a deeper indent on their second and subsequent lines. This is useful if you have section or chapter numbers on long headings, since it makes the section number stand out more clearly.

If you need special formatting for one of your document's headings, but you don't want that formatting to show up in the TOC, create a dedicated style for that heading; the New Style button is at the bottom left of the Styles task pane.

For instance, if you want something that looks like Heading 2, but that's centred, click the New Style button, name the new style "H2 Centred", base it on Heading 2 and click the Centred button. Finally, click OK to create the style. You can now apply it to the heading you want to centre in your document. Since it's based on Heading 2, "H2 Centred" will automatically change to match alterations made to Heading 2, except the alignment and justification of paragraphs. ■

Contents

...

Chapter Nine

In which Piglet is entirely surrounded by water 98

▲ TOC styles can be edited to create multilevel contents pages

STYLE INSPECTION

You can use the Style Inspector or Reveal Formatting dialogs to determine from where formatting elements come. The Style Inspector (at the bottom of the Styles task pane) shows all the paragraph and character styles in play, along with any manual formatting. You can easily clear formatting using the Style Inspector, and clicking any underlined section in Reveal Formatting (Shift+F1) will open a dialog to control that formatting.

The painful Windows update process

JON HONEYBALL BECOMES FRUSTRATED TRYING TO INSTALL WINDOWS 8.1, BUT SEES GREAT PROMISE IN THE SURFACE PRO 2



You know that feeling you get when you realise you're banging your head against the wall, and the pain is getting worse? When you finally conclude that you should just stop banging, accept things the way they are and give in? Well, I arrived at that moment yesterday with my Dell XPS 27in touchscreen desktop. It's been good overall – even though I did have to blow away its Windows 8 installation and start again from scratch – but it appears Windows 8 is still prone to suffering the same Windows Rot that's plagued previous versions.

The reason for my head banging? Well, Microsoft has relented and decided that maybe it's a good idea for the developer community to have access to the final build code of Windows 8.1 after all. Heck, we're the ones writing the apps for this platform, and I'm pretty sure that Microsoft's own Office team wasn't shackled in the same way as you and I. Anyway, after a huge internet outcry, Microsoft has decided to back down (although how it ever convinced itself that the original decision was a sensible one is beyond the comprehension of a mere mortal such as me). But I digress.

I was armed with an installation DVD for Windows 8.1 (once I had carefully downloaded the correct version), and today I wielded it to update the Dell

with said OS image – and Windows told me that it couldn't install the machine without doing a complete wipe. That wasn't any good because I wanted to do an upgrade. I scratched my head while carefully checking that I did have the UK DVD image. Yes, I had indeed downloaded en-gb_windows_8_1_x64_dvd_2707421.iso, which is correct for UK English, but no, it wouldn't install as an upgrade.

A scream or two on Twitter found me the answer: I had to install from the USA English media, despite my Dell being installed in UK English. The UK English image wasn't going to allow me to carry out an in-place upgrade, only a wipe and restart. Getting to the bottom of this paradox took some digging, but it turns out that Dell has used a USA base image for all its installations, then applied UK settings over the top, or some such nonsense. Trying to use the UK image wasn't going to work because it was the wrong one, despite it being UK English on the machine. I downloaded the USA version and – surprise, surprise – the upgrade was successful, and at the end of it I still had my UK English setup on the PC.

It's scenes such as this that make me increasingly hate computers. I don't know why, nor do I even care, why Dell decided to pull this stunt on my UK-supplied computer, but it did. I'm told it would have gone just fine had

I performed the upgrade through the Microsoft Store once it goes on general release. But what would have happened if I had a great pile of these boxes and wanted to update them all from the local network?

This sort of confusion and melodrama demonstrates just how ancient the core of Windows really is, and how lacking it is in modern update technologies. Do I need to tell you that my OS X 10.9 Mavericks installation just worked? Of course I don't, but then Apple also seems to be the only phone company in the world capable of rolling out software updates on a global scale, in all languages, at the same time. I despair of the mess both Android and Windows Phone 8 are in when it comes to knowing which version I should be on.

TUNEUP

Sorting out a messed-up iTunes installation isn't for the faint-hearted. Some may argue – with considerable venom, I hasten to add – that the best thing to do with iTunes is to uninstall it, shoot it in the head and then stamp on its smoking remains for a while. Unfortunately, I can't bring myself to do that. On OS X, it works very well for me: it's reliable, quick, efficient, and does all that I ask of it. Others will often claim that it isn't, isn't, isn't and doesn't – but when pressed, many of these people are actually talking about iTunes on Windows. Now, this version is one that causes me to tear my hair out too. Not only does it not look like a Mac app, it doesn't look like a Windows one either, but rather some weirdly morphed thing. I'll confess that I'm never sure it's doing the right things for me on Windows. So I can understand the wrath of so many.

For myself, on a Mac, iTunes works well once I've squeezed it into the shape that I need. For example, I always run it with the bar down the left-hand side showing, and with Genres, Artists and Albums arrayed across the top. I try to stay away from all that album cover art, and also ensure that all of my library is kept well away from main hard disk storage, stored carefully on an external RAID array. I keep several copies of it, too, just in case something still goes wrong.

It isn't compulsory to keep

“ This sort of melodrama demonstrates just how ancient the core of Windows really is ”



▲ iTunes can work well on a Mac, but the Windows version makes me tear my hair out

everything on the C drive (or on your Mac boot drive): just untick the options for “Keep iTunes Media folder organized” and “Copy files to iTunes Media folder when adding to library”. Doing that lets me drag and drop a whole pile of ripped material from my RAID array onto iTunes, and it will simply merge its metadata into the main library without touching the music files themselves (and, more importantly, without moving them).

However, none of this is of much help if your ripped files suck. Sometimes you don’t have any choice – because they’re not well labelled or their metadata may be messed up – and sorting this out can be a recipe for much hair-pulling. Fortunately, there are tools around that can help. I’ve spent the past few months using TuneUp, which is frustrating in that it’s far from solid and reliable, but when it does work performs near miracles on music files that need their metadata cleaned up.

It sits as a window alongside iTunes for Mac and has its own UI. Drag and drop files onto it and it will go online and perform pattern matching on each file to work out what it’s most likely to be. It does a rather good job, up to the point where it can’t fix things any further (but I guess that’s reasonable – perfection being beyond most of us). I used it to sort out a mess I’d made of some compilation albums and it worked wonders, but other times didn’t really help at all because the mess was too comprehensive. I wish it were a little more stable – sometimes it forgets how to receive a dragged-and-dropped bunch of files, but I’m still pleased that I bought it: it has easily paid for itself in time saved.

There are other tools out there, and maybe you know of a better one: if



Sorting out a messed-up iTunes installation isn’t for the faint-hearted



JON HONEYBALL

Computer journalist and consultant specialising in both client/server and office automation applications.

so, drop me an email. It’s clear to me, however, that keeping a clean ripped music collection is imperative – in fact, I intend soon to restart my big ripping process, which long-time readers may remember. I do this using a dual-DVD Primera ripping box hanging off a Windows machine running dBpoweramp’s ripping engine with its Batch Ripper option. However, I’ve just spotted that Batch Ripper doesn’t support this model any more, because of some sort of firmware upgrade that Primera did. So I need to fire up the rig to see whether mine is still pre-firmware upgrade, and hope that it will still work for me (I’ll be somewhat annoyed if it doesn’t).

WINDOWS 8.1 FOR ENTERPRISE

Recently I gave a talk at the Misco Expo 2013 event held at Old Billingsgate, London. I use the term “talk” loosely – croaking may have been a more accurate description, since I’m recovering from a bout of man flu. As any bloke knows, a dose of man flu is almost always near-fatal, but we somehow manage to struggle through in manly fashion. It was probably just a bad cold, but let’s not pass up on any sympathy that’s going...

My talk was all about applying Windows 8.1 for enterprise and using touch technologies. This is a platform I can get enthusiastic about, but only with a strict and quite non-negotiable set of caveats, limitations and warnings. First, I have no time at all for Windows RT – this ARM-based runt of the Windows litter deserves to be quietly taken outside and forgotten about. For enterprise, its biggest limitation is its lack of Active Directory management. I just know that the Windows rah-rah brigade will chip in here to remind me that basic

management of a Windows RT device can be achieved through the Exchange Server interfaces, but no my dears, that isn’t management – that’s like painting your hallway by pushing a brush through your letterbox. When I use the term management, I mean it to include Active Directory policy, and fully network-based management tools like the ones we use on desktop computers. Anything less is a compromise I’m not willing to accept.

On the upside, however, the latest Haswell chipset device – the Surface Pro 2 – is showing great promise in terms of battery life. Mix in breakthrough technologies such as the 3200 x 1800 resolution (near-300dpi) displays at the 13in form factor, an extremely fast SSD and strong battery life from lithium polymer batteries, and you have the starting point for an interesting platform. Add in 802.11ac very-high-speed networking in the 5GHz frequency band – away from the congested 2.4GHz space – and things become even more interesting. Then add in a built-in, LTE-based modem and suddenly this portable device can obtain truly usable, high-speed network access whether it’s within the building or roaming outside – LTE range permitting, of course.

A few rules and a bit of guidance for you: if you’re writing an app for such a touchscreen device, make sure it really uses the best of touch. If you have to resort to bringing up the onscreen keyboard, then I think you’ve failed. Drive as much data to the device as is needed to ensure that the keyboard is never required, because direct data entry should be avoided at all costs. Pre-populate fields, offer suggestions, drop in selector widgets and so forth. But giving the user a keyboard is an admission of guilt for a truly portable touch environment.

Don’t be worried about running it as a full-screen Win32 application – after all, what’s good enough for Microsoft is good enough for the rest of us. I’d suggest you stay away from Metro until the platform matures into something more useful. I also suggest putting together a skunk-works development team that lives and breathes building touch applications, and then set them a harsh timescale for delivery. By harsh, I mean they should deliver incrementals every eight weeks: week one is for scoping out and defining; weeks two to six are for building; week seven is for testing; week eight is for external testing with a group of willing guinea pigs. At the beginning of week nine, you push out the application to everyone and the

clock resets to week one.

Then ensure that every feature is giving you measurement metrics and feedback. How does a user get at this feature? How long do they stay there? What's the uptake and usage ramping? Are customers finding it awkward and counter-intuitive? We expect to collect all of this information for websites, but corporate enterprise applications still too often flounder into black-box scenarios in which no-one really knows what's going on.

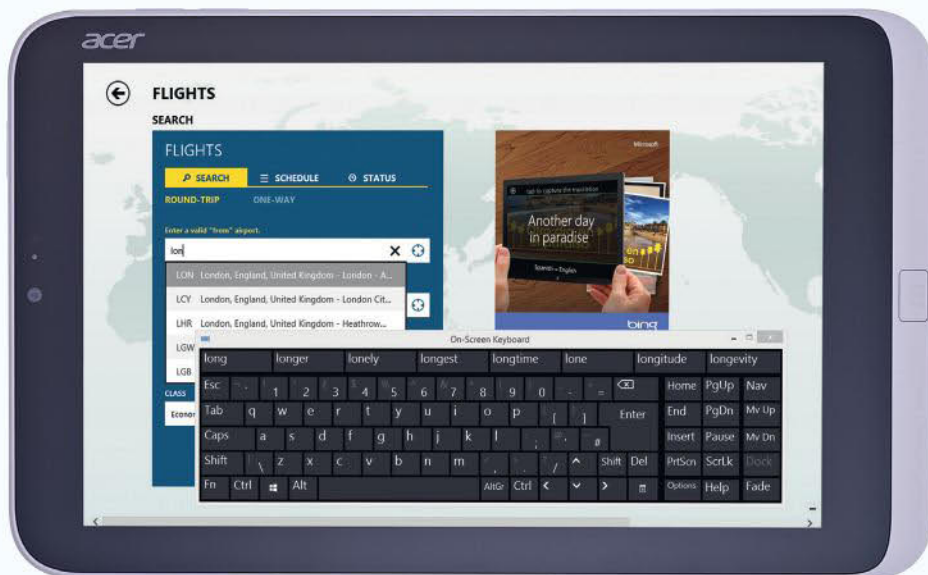
Worse still, you publish the feature roadmap and collect customer feedback starting at week nine and rolling through to week 12, then feeding back into the next eight-week cycle starting at week 12. Far too often, enterprise application development becomes bogged down in such a morass of huge plans, vast visions and infinite scales – and don't get me started on government-led IT projects; they take such errors and multiply them a hundredfold.

Small, sharp deliverables are what's needed. Any quicker than eight weeks and there isn't enough time to do anything serious. Any longer than eight weeks and you find it slipping to 12 and then 16 weeks, and suddenly you're at six months and counting. Of course, all this is based on the understanding that you possess a managed infrastructure that enables you to deploy apps to your devices at the push of a button. You can do that, can't you?

CHRISTMAS TIME

Before you know it, it's time for Christmas. So let me get my recommendations in early this year. My recommendation for dad is going to be ludicrous, but I'll make it all the same, simply because it's a piece of kit I've fallen in love with and use all the time. I won't attempt any excuses for the cost, other than to say that it's probably the very best example in its field anywhere in the world. So don't even think about bashing me by email on cost grounds.

Much of the time I listen to music on headphones: in the frantic modern world it's nice to be able to shut out everything, relax in a comfortable chair and



▲ A truly portable touchscreen application shouldn't resort to the onscreen keyboard

float downstream. I needed a pair of reference-grade phones for monitoring, but they had to have a standard half-inch jack plug so they could be plugged into almost anything, and this requirement ruled out the otherwise wonderful Stax electrostatics, which rely wholly on an external processor/amplifier box. No, my headphones had to be able to run as normal, standalone phones when required, but I also wanted the best – and there really isn't anything better than the top-of-the-range Sennheiser headphones, the HD 800. Ferociously expensive, at around \$1600 (I did warn you), but supremely comfortable and ruthlessly revealing sound-wise – both factors that matter a whole lot if you spend hours doing professional-grade audio and video work.

Sennheiser recently took things one stage further with the arrival of its HDVD 800 amplifier unit. Capable of driving four headphones at once, this box features a complete digital and analogue stage running with

24-bit and 192kHz samples. What's interesting for the pro user is its range of inputs – standard hi-fi-style unbalanced inputs, fully balanced XLRs together with outputs, and a great array of digital feeds (USB, optical TOSLINK and AES/EBU for those who work in the pro audio field). I'll say it again: this is a seriously high-end tool for professionals who want the best. If you work on audio or video at the highest level, an investment in this kit will reap benefits for years. It would also make a fantastic, if arguably over-the-top, pressie for dad. Start saving – he's worth it, you know. ■



OFFLOAD IT

The USB feed on Sennheiser's HDVD 800 amplifier is interesting: just plug it into your Mac and it will appear as a Core Audio device, whereas a Windows PC requires a driver to be loaded. But you can then offload all the audio work from your computer's CPU onto the specialist DACs contained in this box.

► The Surface Pro 2 looks promising



Network Effects

FIONA TEAKLE GIVES SOME TIPS ON HOW TO TAP INTO THE HIDDEN ICT JOBS MARKET

As we continue to change the world with the use of ICT, one thing that has changed dramatically yet sometimes goes unnoticed is the way in which we search for and obtain a job. While old methods such as newspapers may still work for some, for the majority these forms of job searching are no longer working. We are seeing an increase in people being hired from non-traditional methods. So what are you doing to ensure you are in the right place for your next job?

When we start to think about finding a new job, most of us are instinctively drawn to the following methods to find out about the market:

- Newspapers
- Seek.com/employment websites
- Recruiters

While this may give you some insights into what is out there, research is showing that fewer people are in fact finding employment via these methods. Traditional methods of job seeking are finding too many applicants applying for the roles; the best jobs may even be filled before they ever hit these methods. According to the Australian Bureau of Statistics in 2012, people found that too many applicants for available jobs was the reason for 16% of people unemployed for less than a year not getting the job, and 14% of those unemployed for more than a year.

Now, I'm not saying that the more traditional methods won't work - they may - but while looking at these options there are also a number of additional methods that you should be investigating.

Some of the new ways in which people are finding jobs are:

- LinkedIn
- Networking events
- Joining user groups/special interest groups
- Listing companies they want to work for and calling them

These are some of the keys to the hidden job market.

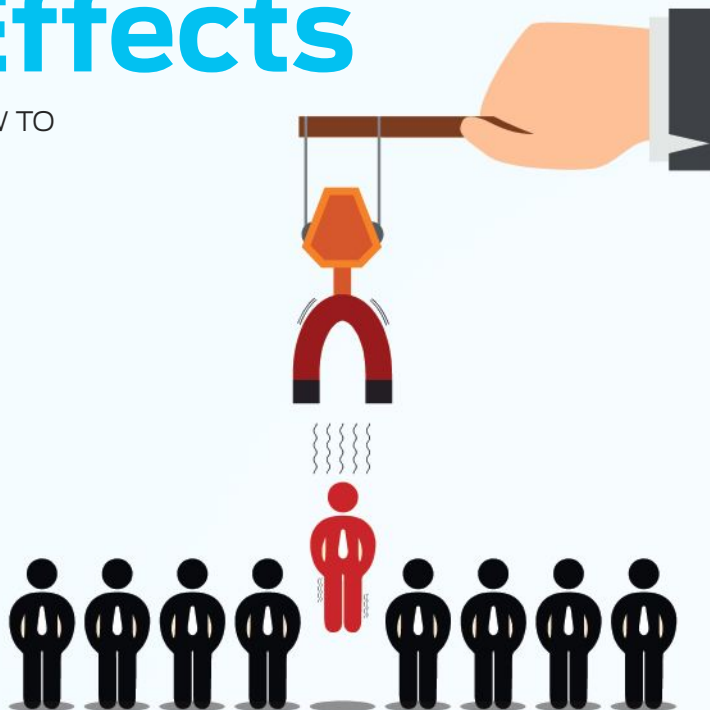
Networking has been a proven method of job hunting for a number of years, but as the job market continues to be flooded with



Traditional methods of job seeking aren't the only way anymore



FIONA TEAKLE is Director of the ACS Young IT Board. You can contact her at fionateakle@acsmail.net.au



applicants, the ICT industry is turning more towards who we know, not what we know.

Is it always the best person who gets promoted? Not always. Increasingly, it's the person who knows someone else.

With this in mind, what are you doing to network inside your company and industry? The ACS offers many events which will assist in networking in the industry, but is there a strategy you can take into your workplace? Within the workplace, the best people to utilise are your managers or mentors who have your best interests in mind. They may be able to put you in contact with opportunities through people they know or give you a chance to learn more about the area you are thinking of moving into.

If you are actively job-seeking, HR expert Jill Noble says you should be attending at least 2 networking events a week. While at an event, aim to meet at least 5 new people and follow up within a week of meeting them.

The value that professional social networking site LinkedIn has to offer, having been around for over 10 years, is becoming increasingly clear when used correctly. To ensure you are getting the most from the site, you need to have detail on your page which is relevant to what you are trying to achieve. Ensure that the information

makes you stand out from other people with a similar skill set. How can you make sure people think "wow!" as soon as they read something about you? The other critical aspect of LinkedIn is your connections - and it's not just about who you are connected to, but who your connections are connected to. These are the people who will add reach to your page once you are connected.

If you are looking at a list of the company you want to work for, then one way of engaging with them professionally is via LinkedIn. This is a major change in behaviour. You can show your interest and gain a better insight into the company before applying for roles there. Not only can you see the trends the company is promoting, but also recommendations staff are making. This allows you to make a more informed decision about working for that company.

As a member of the Australian Computer Society you have access to over 20,000 professionals nationally who may be able to help put you in touch with your next job! The ACS runs networking events every week, all over the country, which will provide you with a direct way to meet new people. So what is the next step you are going to take to find your next job? Remember this won't happen overnight, so if you are looking to move in the next 6-12 months, you need to start now! ■

MARKET PLACE

YOUR GUIDE TO DEALS
AND PRODUCTS
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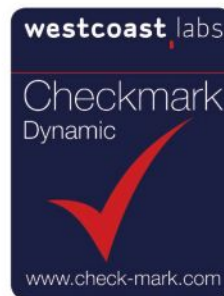
TOP DEALS

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JON HONEYBALL goes from hole-in-the-wall to bank-in-his-pocket

“I remember the day in the late 1960s when my parents received their first bank cards. These were from Barclays, and were quite literally a sheaf of thick cards made of cardboard. They had holes punched in them, because they were real computer punch-cards at heart. They came in packs of five, and each was for a fixed amount of cash, worth something like a fiver or a tenner maximum.

A quick internet search suggests the first of these machines, the Barclays De La Rue Automatic Cash System (DACS), was installed in the Barclays branch at Enfield, North London, in mid-1967. To use it, you went to the main office – on Chelmsford High Street, in our case – whereupon there was this mechanical edifice built into the wall. It was vault-like in its appearance and feel. You pulled out a massive steel drawer, placed the card on the special mounting plate, and then the machine dispensed the money. It was the very beginning of the arc that has today come full circle.

Since then, the interaction between users and real money has become increasingly electronic and self-serving. Getting a credit card was a big deal back then, and for a company to offer payment services was a huge step. As it became more ubiquitous, we witnessed the arrival of the real “hole in the wall” ATM, which allowed you to get cash using a plastic card in a matter of seconds. Then we had the arrival of the “merchant services” facilities for companies. Although these too weren’t easy to deploy, with significant issues for liability and implementation, they nevertheless brought plastic-card handling to the high street.

Of course, the next big revolution came with the arrival of the internet and e-commerce. Now everyone needed to handle payment processing as part of their line of business. Bureau services sprang up to service this need, whereupon your website handled the electronic basket, but handed over the payment part to a trusted third-party solution. Today, it’s almost trivial to set up such a solution on a commercially

“We don’t need cash anymore, not even for a payment between mates at a restaurant, splitting the bill for the curry”

orientated website, handing over all responsibility to companies such as PayPal and Sage, among others.

But the real democratisation hadn’t happened – putting credit-card processing in the hands of the general public. Until a few months ago, when we noticed the arrival of solutions such as Payleven in the Apple Store. Other solutions are available, too, such as the Square device that’s been a huge success in the US, which is largely based on the same principles.

I bought into the Payleven system, and a small chip-and-pin reader came in the post from the Apple Store, costing the not-so-princely sum of £83. (\$142) Getting the account set up to process credit-card payments was the matter of a few mouse clicks. I could either set up a personal account or one for my company.

Then came the moment of truth – processing my first transaction.

The Payleven unit connects to the iPhone via Bluetooth, and is handed to the person making the payment into which they insert their card and authorise it. The iPhone software makes the connection to the internet to process the payment. It takes only a few seconds, and it’s done.

A trial payment took £1 from my debit card and transferred the money back into my bank account, minus the 2.75% handling fee, although there’s no monthly minimum and no rolling minimum floor limit.

In a few moments, I had done – in my living room – what had been the ultimate destiny of what I had first done as a small child: to interact with money in a purely digital fashion. Back then, DACS took a token and gave my parents cash. Today, we don’t need cash anymore, not even for a payment between mates at a restaurant, splitting the bill for the curry. I could pay for the whole thing myself, and then take electronic payment from all my friends. If they insisted on a paper receipt, then the optional Bixolon battery-powered Bluetooth printer will spit out a paper transaction record, too. Indeed, this month Square launched a new (US-only) system that allows you to pay friends simply by sending them an email, with the amount owing in the subject line.

This is the end of the arc, whereby Joe Public can be finally detached from cash once and for all; where payment processing can be in the pocket of a merchant of the smallest of sizes and most infrequent of uses. The small boy who looked up in awe at the huge electronic cash machine in the 1960s can now carry something vastly better in his pocket every day. ”



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EDITORIAL

Managing Editor: David Hollingworth:
dhollingworth@haymarketmedia.com.au

Editor: John Gillooly: jgillooly@pcauthority.com.au

Art Director: David West

Creative Director: Sam Grimmer

REGULAR CONTRIBUTORS

Rosalyn Page, Jon Honeyball, David Fearon, David Bayon, Barry Collins, Sasha Muller, Tim Danton, Tom Arah, Ian Wrigley, Simon Brock, Jonathan Bray, Bran MacEachaidh, Jenneth Orantia, Dan Rutter, Ashton Mills, Adam Turner

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ADVERTISING

Phone: (02) 8399 7603 **Fax:** (02) 8399 3622
Commercial Director:
Darren McNally: dmcnally@haymarketmedia.com.au
Group Advertising Manager:
Joanne Nichols: jnichols@pcauthority.com.au

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