

PC & TECH AUTHORITY

MOBILE SPECIAL

2013's BEST APPS & PHONES

50 ESSENTIAL APPS
FOR ANDROID, IOS,
WINDOWS & BLACKBERRY

13 SMARTPHONE RIVALS
COMPARED FOR VALUE,
FEATURES & PERFORMANCE

TECH SHOW ROUNDUPS

COMPUTEX

We've seen the future of the
PC and it's looking bright!

E3 All the games & gear to
look forward to this year

TECH ADVICE YOU CAN TRUST

IN THE LABS

MICROSOFT SURFACE **PRO**

Ultimate tablet, or
too little, too late?



WINDOWS TOP TWEAKS

CUSTOMISE
YOUR OS TO
SUIT YOU!



AUSSIE SMARTPHONE PLANS RATED

We find the
best for your
habits and
device



REVIEWS

TOSHIBA KIRA
ULTRABOOK,
SONY XPERIA
TABLET Z, LG
Z360 ULTRABOOK,
TI DELUXE 4770K, INTERNAL
HARD DISKS, CANON 100D,
LOGITECH G710+ & G700S,
ASUS ROG
MAXIMUS
VI GENEL
AND MORE!



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5 REASONS TO CHOOSE ASUS Z87 MOTHERBOARDS

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- EPU: All-round energy efficiency
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- Fan Xpert 2: Customized fan control for the perfect cool and quiet balance

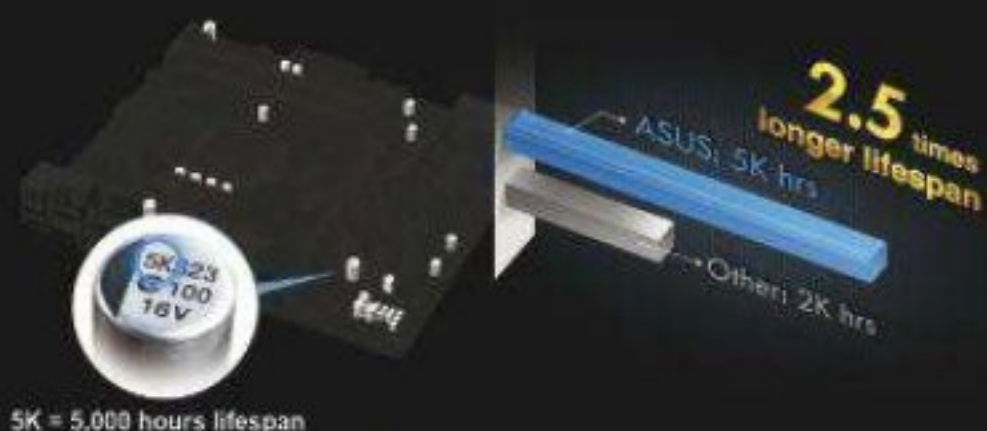
2



Enhanced DRAM overcurrent protection
Short-circuit damage prevention

Onboard resettable fuses prevent overcurrent and short-circuit damage. This extends beyond I/O ports to DRAM to safeguard system and device lifespan.

4



All 5K-hour solid state capacitors
2.5X longer lifespan with excellent durability

ASUS 5,000-hour solid state capacitors last 2.5 times longer than traditional capacitors. They pass strict testing and meet the highest standards to enhance durability and thermal capacity.

1



DIGI+ VRM

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3



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5



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3X more durable corrosion-resistant coating

ASUS uses strong and corrosion-resistant stainless steel to make I/O panels, which pass 72-hour salt spray endurance tests and have a usage life three times longer compared to ordinary panels.

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Tech advice you can trust!

- 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



SMALL BUT MIGHTY

When Intel first lifted the lid on its Ultrabook concept we suspected that the real benefits for end users would stem not from these low power devices, but from the way in which they influenced the entire laptop market. This trend is well underway, as we see this month with our first look at a prototype Haswell laptop, packing unheard of levels of power into a sleek and slim chassis.

It isn't just in the laptop space that we are seeing such power. Just take a look at our annual roundup of smartphones, and you'll find that even the budget models are powerful enough to deliver a fully rounded mobile computing experience. For \$200 you can get a unit that is capable of everything a \$1000 handset could do a few years ago, and the high-end superphones are now capable of some truly astonishing feats.

In order to make the most of this ever-expanding power you need the software, which is why we have also put Jenneth Oranthia to the task of coming up with the 50 Essential Apps for smartphone owners. These include some you would have heard of, but more importantly others that will not be on your radar. Actually finding the right Apps for your needs is one of the hardest things to do, which is why we tasked a true expert to do it for you.

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THE TEAM...



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Last month I made the switch from iOS to Android and the world didn't end. Maybe Google has a chance after all.



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My dream of remote control killer attack dogs is coming true after all these years. Thank you COD: Ghosts, thank you.

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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.
- **Get the app:** *PC & Tech Authority* for iPad <http://tinyurl.com/iPADPCTA>



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and tablets



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INBOX

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Please limit letters
to 200 words, where
possible. Letters may be
edited for style and to a
more suitable length.

I am a 7-day subscriber to a Sydney newspaper and can access the iPad edition at no extra charge.

I am a member of a motoring organisation and receive the paper edition of its magazine by post and can access the iPad edition at no extra cost.

I subscribe to a US hobby magazine for an extra \$12 per year that enables me to access the iPad edition of this magazine.

So why should I pay another subscription for the 'privilege' of being able to access the magazine on my iPad?
J. Smith

John Gillooly says: That's a very good question indeed. You'll be happy to know that it's something we're currently looking at offering. It's a little trickier than we'd been hoping, but it is definitely on the cards!

PRINTER AWAY!

My Canon MP640 failed after only 3 years of light work so I dived for *PC & Tech Authority's* recommendations.

Top of the list is Canon MG 5460 which I purchased.

What a mistake. It is by far the rowdiest printer I have ever heard. The mechanism just grunts and growls and, frankly, sounds like it is destroying itself. Then it prints loudly. The printing is good but I do not think I can stand it much longer.

It may well become a boat anchor.

P. Nader

John Gillooly says: We didn't notice too much noise from our review unit. But I must say, that is a unique solution to a printer problem!

TOP SITE COMMENTS

You're lucky I trust your judgement... most times ;) Might pick up the game on Thursday... god knows I need something to pass the time away at work.
Ekythump almost trusts us.
Web ID: 347088

I see so many people get caught up in the hardware that they forget about the software! That stuff aside, we've got some great buys in the middle range at the moment.

ddevine weighs in on video cards.
Web ID: 346545

I loved my HTC One X at purchase, now I don't... I want 4G!

FabMan_UK expresses buyer's remorse.
Web ID: 346819

I would love to see a model based on a collaborative blend using Google users' personal music stash, which would allow more obscure content and interesting social interactions. The copyright issues will probably prevent this, but if that personal music is streamed and isn't downloadable, I see the possibility that it could see light of day.

gnome is not as fond of Jorj_X_McKie on iTunes radio.
Web ID: 346556

Meh, 41 MP, with an aperture that small 60% of the pixels will probably just contain noise!
TheToid is not convinced about mobile phone cameras. **Web ID: 345991**

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

Why do we still label those who claim video games cause violence in youth culture as 'experts'?

Surely that type of statement should bring that label into question?

Yet media still do it!

A study came out this week saying the 17-19 year old age group is the most responsible for crime and YES they blamed video games.

And yes it is the year 2013!!!

M. Hall

John Gillooly says: Ah, a topic close to all our hearts here at *PC & Tech Authority*. As avid gamers ourselves, we've always found the mainstream media's constant attempts to correlate gaming with the impending collapse of society to be a mix of bemusing and irritating. Rest assured, it's not a theory we share.

IPAD FOR ME, IPAD FOR YOU

I have just completed your latest survey and the question regarding the reading of the magazine and/or articles in it on a tablet raised this question in my mind.

I am a subscriber to *PC & Tech Authority* and have been for a number of years, so why should I have to pay another subscription to be able to access the magazine on my iPad when it may be more convenient to access it this way?



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

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AUGUST
2013

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TECH NEWS

LATEST TRENDS AND PRODUCTS IN THE WORLD OF TECHNOLOGY

LG RELEASES NEW ULTRA-BOOK AND TABLET RANGE

LIFE'S GOOD, ESPECIALLY IF YOU LIKE THE LOOK OF THE H160 AND Z160 TAB-BOOKS AND THE Z360 ULTRABOOK.

LG's declared a return to the PC space with two new product families just announced today.

The LG Z360 Ultrabook is a sleek, light, and very white laptop with a 3rd gen Core i5 processor and a focus on the lower end of Intel's ultrabook spec. The LG Tab-Book series is the company's entry into the hybrid and tablet spaces - the H160 Tab-Book is a pure Windows 8 tablet device, while the Z160 model features a keyboard underneath a slide-away touch screen.

LG hosted a closed-door briefing yesterday on the products ahead of this morning's announcement, and while we didn't get our hands on the pure tablet, we did get to test-drive engineering samples of the hybrid and ultrabook.

The Z360 is a departure from most metallic shell notebooks, and while the design is very clean, the white plastic does look as though it will start to grime up at the drop of a slightly dirty hat, especially on the slightly rougher fascia around the touchpad and keypad.

That said, with 4GB of RAM and a Core i5 3337U processor, it's zippy enough on the general computing side of things. It comes standard with a 128GB SSD, WiDi, USB 3 and the rest of the upgraded ultrabook spec.

It's also very light and slim, and feels like a great carry-with-you-at-all-times computing device, with a responsive keyboard and a bright 13.3in IPS LCD,

running at a resolution of 1920x1080. If the white body doesn't scare you, the Z360 will retail for \$1399 and be Harvey Norman in early July.

The Z160 hybrid tablet continues the mighty whitey look, and features a push-button mechanism that slides the touch IPS display up and into a comfortable viewing angle, revealing the keyboard beneath. LG assures us that each device has the hinge and locking mechanism tested thousands of times, but it does seem a little on the light side, with the monitor ribbon and other wiring exposed between the display and the keyboard, just behind the hinged stand it all rests on.

That said, it comes with a suitably beefy spec, packing the same RAM and processor as the Z360, with a 120GB SSD. It's very much a device aimed at professionals who need a dedicated keyboard, along with tablet portability. The Z160 will also be available in early July, and will retail for \$1499. The H160 Tab-book will be out at the same time, for \$999.



SKYPE 6.5 IMPROVES VIDEO MESSAGING, SIMPLIFIES CONTACT REQUESTS

MICROSOFT HAS TODAY RELEASED SKYPE FOR WINDOWS DESKTOP 6.5, FEATURING IMPROVED VIDEO MESSAGING AND SIMPLIFIED CONTACT HANDLING.

Aga Guzik, head of Desktop Product Marketing at Skype, explained that the new build "improved the stability of video messaging and made video messaging easier to find with improved notifications".

Skype 6.5 also makes it "more intuitive to send and accept contact requests", claimed Guzik, as "accepting a contact request will now appear right in your instant message view".

The new release also brings some significant bug fixes.

Stability is improved by fixing crashes (for

some users) - on exiting Skype or trying to send a file, for instance.



And a particularly annoying set of file transfer issues - "cancel all" doesn't cancel file transfers, upon cancel of a file transfer the transfer shows as successfully completed, and when one participant accepted file transfer the sender could not cancel the transfer - have also been successfully resolved.

This latest build is still very much a work in progress. Video messaging may be "improved", for instance, but it's still in preview, and presumably that's not about to change any time soon.

FACEBOOK PROMISES TO MAKE MORE EFFORT TO STOP GENDER-BASED HATE SPEECH

A COALITION OF WOMEN'S RIGHTS GROUPS HAS AT LAST GOTTEN A RESPONSE ON FACEBOOK'S LAX ATTITUDE TO SEXIST AND HATEFUL SPEECH

Facebook is not known for its sensitivity, or even a sense of fair play, when it comes to censoring what it considers problematic content. On the one hand, the company has famously taken issue with images of breastfeeding, while seemingly turning a blind eye to various forms of bullying and hate speech, such as the remarkably racist 'Aboriginal Memes' page. Last week a number of women's rights groups came together to write an open letter (<http://tinyurl.com/l2sgt3t>) to the social media giant upbraiding it for the uneven nature of its policing of hate speech against women.

The letter to Facebook cited a number of groups with plainly violent and aggressive names as indicative of the site's failure to regulate hate speech.

Facebook has now responded with a post on its Facebook Safety page, and is promising to take the issue more seriously.

"In recent days, it has become clear that our systems to identify and remove hate

speech have failed to work as effectively as we would like, particularly around issues of gender-based hate. In some cases, content is not being removed as quickly as we want. In other cases, content that should be removed has not been or has been evaluated using outdated criteria. We have been working over the past several months to improve our systems to respond to reports of violations, but the guidelines used by these systems have failed to capture all the content that violates our standards. We need to do better - and we will."

Facebook has stated that it will address the guidelines that define hate speech, work on training its review teams and boost accountability of content creators. At the same time, though, Facebook admits that it can be difficult to ascertain the difference between true hate speech, and what it classes as mere "distasteful humor".

We're not so sure that telling the difference is all that hard.

HOT... OR NOT

HOT

SILVERSTONE

It's not often we get blown away by a product at Computex, but Silverstone's production VGA chassis, for adding desktop graphics to ultrabooks, is just amazing. We cannot wait to see one in the flesh.



NOT

CONSOLE WARS

After E3, everyone has an opinion on who has 'won' - which is a touch early if you ask us. Until the pricing of the actual games is revealed, there's still a lot of fighting to come yet, and the results could be very surprising indeed.



THE START BUTTON DEFINITELY RETURNS IN WINDOWS 8.1

ONE OF THE MOST MISSED ELEMENTS OF THE WINDOWS UI IS MAKING A TRIUMPHANT RETURN IN WINDOWS 8'S FIRST UPDATE.

Windows 8 has been met with what can only be called mixed feelings. While the new operating system is a no-brainer for purely touch devices, on desktop machines it's been less than successful, with low up-take from established Windows users and at retail. However, in the new Windows 8.1 update, one of the most missed aspects of previous releases is coming back.

The Start Button will be included, and by default turned on, in Windows 8.1, the update otherwise known as Azure.

As reported by Winsupersite.com and ZDNet, the button's back, but it does behave very differently. It sits in the same spot, but clicking on it will not bring up the old (or

current, if you're still using Windows 7 or earlier) Start menu.

Instead, it will open the current Start Screen. Close, but no cigar, but it will be interesting to see if this leads to more people switching operating systems.

Other changes include the ability to boot straight into the desktop, and the ability to share wallpapers between both the desktop UI, and the Start (or Metro) background, for a more homogenised experience between the two iterations of the operating system.

Windows 8.1 is available for a public preview now - if you've got an opinion on the preview of the update, please let us know!



GAMING NEWS

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

\$599 XBOX ONE TO GO ON SALE IN NOVEMBER

MICROSOFT'S BIG E3 PRESS CONFERENCE DETAILS LAUNCH PRICING, AVAILABILITY AND SPECIAL EXTRAS FOR THOSE WHO PREORDER THE NEW CONSOLE

After a somewhat polarising debut of the Xbox One a few weeks ago, Microsoft has focused heavily on the games for its big E3 press conference. Not only did it answer the burning question of pricing and availability, but it lifted the lid on an assortment of exclusive launch titles for the console and went into more detail about what its Xbox Live Gold offering would bring to the table.

The biggest take-away was that the console will hit shelves in November, with Australia being included. Locally it will be priced at \$599 for a package that includes the console, Kinect, one controller and a 14 day trial of Xbox Live Gold. In addition to this, Microsoft announced that it would be offering a limited edition commemorative bundle for those who preorder the console. This will include a limited edition version of the controller and a special 'Day One' achievement.

In addition to the console bundle, Microsoft also announced that it would be offering special downloadable content for those who preorder the exclusive launch titles. This includes the usual assortment of maps and special characters - the full

list can be found below:

- Ryse: Son of Rome - Exclusive multiplayer map and sword with bonus attributes.
- Forza Motorsport 5 - Access to four cars tuned to the top of their class.
- Kinect Sports Rivals - Exclusive sporting equipment that separates your Champion from the rest of the world.
- Dead Rising 3 - Exclusive Frank West and Chuck Greene Tribute Packs with bonus attributes.

As an incentive to keep people subscribing to Xbox Live Gold in the leadup to the Xbox One launch, Microsoft also announced that it would be giving subscribers a free downloadable game for the Xbox 360 every fortnight between July 1 and December 31st this year, while also announcing a special 'Day One' Xbox live gold membership that includes access to an exclusive character for the Xbox One launch title 'Killer Instinct: Round One'.

PLAYSTATION 4 TO COST \$549 IN AUSTRALIA

SONY TO STILL HAVE THE CHEAPER NEXT-GENERATION CONSOLE, BUT THE GAP IN PRICES ISN'T AS LARGE AS IT IS IN THE STATES

Sony has rapidly followed up its E3 announcement of the PlayStation 4's pricing with the local version, with US \$399 turning into \$549 here. This still makes it cheaper than the Xbox One, which is set to cost \$599 in Australia, but the smaller gap is likely to make the decision between the two consoles a bit tougher.

Also announced during the press conference was the fact that Sony will now charge players to use online multiplayer features, one of the main points of differentiation between it and Microsoft in the current generation. PlayStation 4 owners will need a PlayStation Plus subscription to take advantage of such features, although they won't need it for single player titles. PS Plus currently costs \$69.95 for a yearly subscription.

Being the cheaper player in the console game is a massive change from last generation, when the PlayStation 3 launched at a whopping \$999.95 price.

What we don't know is how much the games for either console will cost, and whether the competing DRM solutions being employed by each company will have an impact on game costs - though we are sure more information will come to light well before the consoles actually hit shelves at the end of the year.



WHOOOPS, THERE GOES BLIZZARD'S TITAN...

THE NEXT BIG MMO FROM THE WORLD OF WARCRAFT MAKER HAS HIT A SLIGHT SNAG... IF YOU CAN CALL A PROJECT RESTART SLIGHT!

While World of Warcraft is still making more money than many small nations, the game is undoubtedly experiencing an unprecedented level of decline. Many had been looking forward to seeing more of Blizzard's next MMO offering, Titan, on show at this year's Blizzcon. The expectation for the game is pretty high, but it looks like we'll be waiting a while yet to see what it looks like - Blizzard's pretty much pulled the ripcord on the entire project, and started over again.

The 100-person team has now been

reduced to 30 developers. The new best-guess for the game's release is 2016, though Blizzard's Mike Morhaime has told IGN there are no date announcements just yet.

What this means for Blizzcon, a show that has always been at its best with a big core announcement to work up buzz, is anyone's guess. The only thing on the horizon for Blizzard now is Diablo 3 for PS4, and the Warcraft card game, Hearthstone, with the third chapter of Starcraft 2 coming some time next year.

This time for sure?



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MOST WANTED

THE NEWEST HOTTEST PRODUCTS THAT WE SIMPLY CANNOT WAIT TO REVIEW!

► MANFROTTO ML120 HOTSHOE LED PANEL + KLYP CASE FOR IPHONE

There comes a time in one's dedication to mobile phone photography when one should probably just admit they really do want an SLR, and just pony up the cash. That point likely comes when you're thinking of adding a fancy LED flash to your iPhone 4 or 4s, but in case you want such a thing, and still don't care to get a real camera... you're going to love this.

The Manfrotto LED Panel casts a softer light than you might expect, using its size to create an even lighting source for more even colours. The light attaches to an included case, and can be attached to multiple points for different lighting effects, and can face forward or backward.

But seriously, maybe get a proper camera?

www.thinkgeek.com



▲ LIFEPROOF NUUD CASE FOR IPAD

iPads are generally pretty tough devices, but accidents can - and more than occasionally do - happen, and suddenly your shiny and expensive tablet is dented, cracked, or even worse. If you tend toward being clumsy, it's even more likely to happen, and if you use your iPad on the road a lot... yeah, bad times.

But not if you've got a nuud case from LifeProof.

This two-part case features a rubber seal that sits around the screen, making the iPad waterproof to a metre or so, and resistant to all kinds of shocks and drops. It even features a special screw-in adapter for the 3.5mm jack, keeping the seal tight even when headphones are attached. And on top of all that, it turns your iPad into something that looks a lot like a PADD from Star Trek: The Next Generation, which is pretty cool in our book.

www.lifeproof.com

▼ WREN SOUND SYSTEMS V5PF

The iDevice market gets a lot of love when it comes speakers and other accessories, but what if you're on the Android side of the mobile device fence? If that's you, one answer is the new Wren V5PF speaker system.

The V5PF combines old-school construction and modern audio technology to provide the best possible solution for wireless streaming from any Android device, to multiple speakers in a single location. Want to pump Nicki Minaj to every room in your house? You're mad, but you can with this setup!

With the companion Play Fi app, you can stream lossless synced audio to multiple speakers (or just one), and it can connect over the home network, too, meaning your phone can be anywhere.

www.connexus.com.au





◀ DENON CEOL PICCOLO

If digital audio is your thing, then this stereo system from Denon is targeted at you. It is a high end micro system without a CD drive. Instead it packs extensive network connectivity, a smartphone dock and support for internet music sources like Spotify.

Add to that the ability to drive the entire system with either an iOS or Android App and you are talking digital audio nirvana. Just hook it up via Ethernet or Wi-Fi and with a few clicks you'll be accessing your music collection, whether it lives on a NAS or network share or somewhere in the cloud.

www.denonasia.com

◀ BOSE COMPANION 2 SERIES III SPEAKERS

Without really trying, we're more than a little audio-focused in our techno-lust this month, and probably top of all the items we most want would be these PC-focused speakers from audio maestro Bose.

The Companion 2 Series speakers are designed for desktop use, and integrate digital signal processing that delivers a clearer and more natural audio experience. They can be simultaneously connected to both a PC and another device, such as an iPod or phone, and are focused towards clean and powerful sound, especially the effects of modern games.

www.bose.com



▲ BOWERS & WILKIN C5 HEADPHONES

Sometimes you just want to block out the world, tuning out everything around you so you can zen on into whatever you're listening too - music, Anthony Robbins audio books, legally obtained episodes of Game of Thrones. Noise isolating headphones are the way to go for this kind of world-denying immersion, and the new C5 'phones from Bowers & Wilkin do the job wonderfully.

Designed to sit comfortably in the ear, and stylish to boot, these titanium-crafted in-ear headphones are tough as well as great-sounding, making them perfect for using while jogging, or secure in the knowledge you can stuff them in a bag for long-haul travel.

And while the C5's block out some noise, they let in enough that you're not going to get run down by unheard buses. Definitely a plus.

www.e-hifi-com.au

▼ NEW WD SLIM DRIVES

It's not likely you'll be able to pick up one of these drives at retail, designed as they are to help slim down ultrabook design while boosting storage size and performance. Still, in terms of Western Digital's latest effort earning the Most Wanted moniker, we think you'll agree: these are definitely desirable devices.

The new range includes WD Black Ultra-Slim Solid State Hybrid Drives (at 5mm thick), Slim Solid State Hybrid Drives (7mm thick), and WD Blue Slim (7mm) and Ultra Slim Hard Drives (5mm).

That's tiny!

The Ultra Slims pack in 500GB of storage, and the 'merely' 7mm thin models up to 1TB. Ultrabooks just got a lot more inviting.

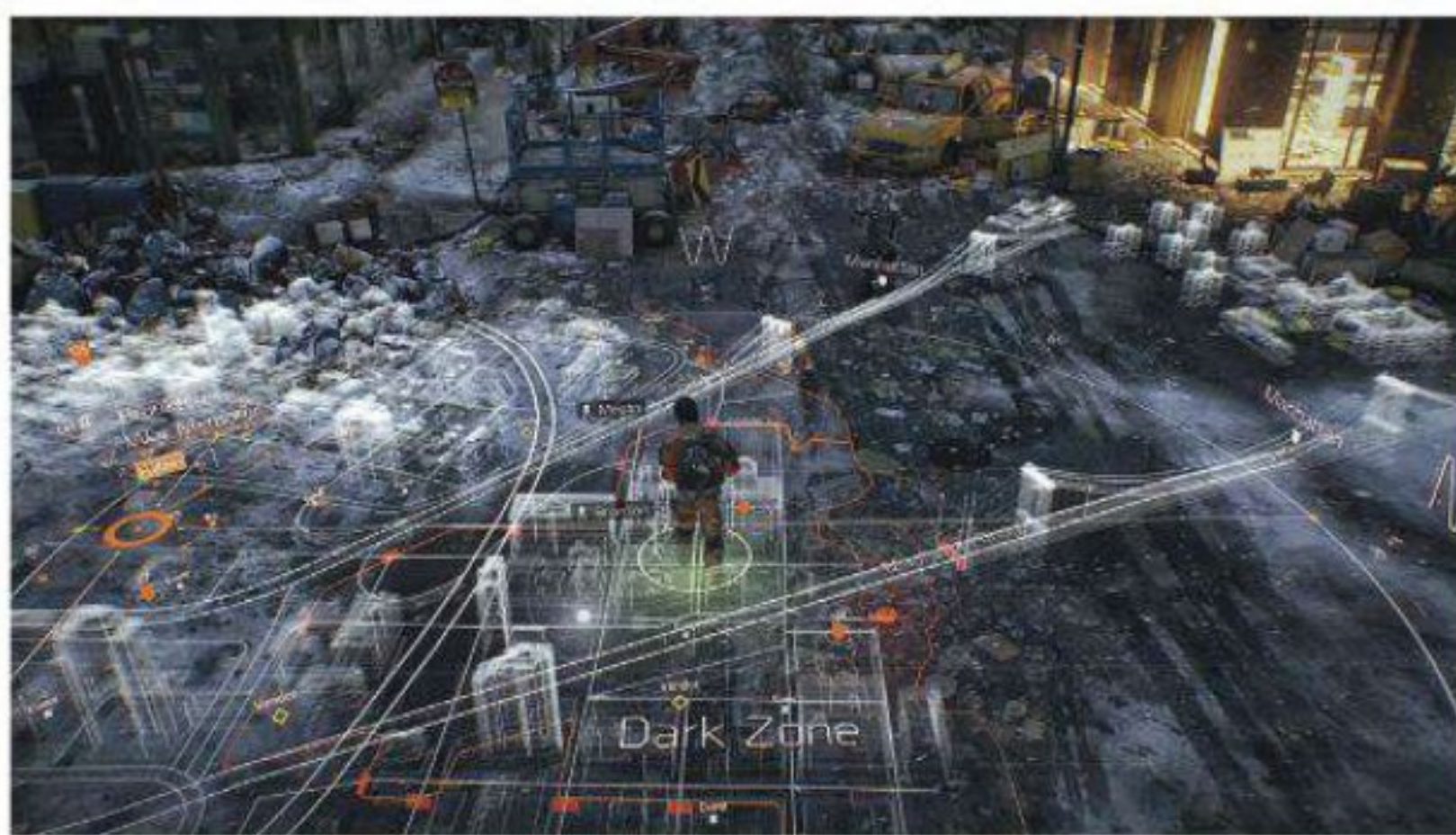
www.wdc.com



MOST WANTED

E3 EDITION!

HERE'S OUR TOP FIVE GAMES FROM THIS YEAR'S E3, HELD LAST MONTH IN LOS ANGELES. THE SHOW WAS VERY FOCUSED ON NEXT-GEN CONSOLE HARDWARE THIS YEAR, AS WELL AS A RAFT OF SO-CALLED NEXT-GEN LAUNCH TITLES, BUT THERE'S SOME MEATY GAMES COMING UP AS WELL – SOME WE'VE SEEN, AND SOME ARE COMPLETELY SHINY AND NEW...



◀ TOM CLANCY'S THE DIVISION

Ubisoft's just-announced action RPG looks like it takes more than a little bit of inspiration from hit PC game DayZ. It's a persistent, open-world game with tense combat between not only AI enemies, but also roving parties of other players, as they all seek to survive in a vast post-apocalypse New York.

Sadly, it's also only been announced for the Xbox One and PS4 at this stage, which seems a real shame.

Still, it's looking like a great advertisement for getting a new console, as the tightly integrated social elements seem to really work to the competitive co-op nature of a lot of The Division's gameplay. And the new Snowdrop engine looks supremely detailed and powerful, especially when it comes to environmental destruction and combat effects.

However, it's the sense of exploration the game delivers, via in-game items like augmented reality maps and notice boards listing points of interest, that make the game seem like something special.

Ubisoft



▶ MIRROR'S EDGE 2

There's been little more than the announcement made on this one, plus a handful of screenshots and an amusing but brief slip-up on the EA website, but a sequel to the surprisingly good free-running game is now confirmed.

Mirror's Edge was flawed, but it's still one of our favourite games of recent years. It was a fresh look at first-person gaming, with a clean design aesthetic and some wonderful mechanics. But it also had some trouble working out just what kind of game it wanted to be, so we're really hoping that DICE can learn from those mistakes, and leverage the impressive Frostbite 3 engine to make a spectacular game that lives up to – and exceeds – the first game's promise.

Electronic Arts



► MAD MAX

Well, how can any red-blooded Australian film fan NOT get excited about the idea of a game set in the rough and tumble Wasteland of the Mad Max films. Even better... you get to be Max, tooling around the desert in the last of the great V8 interceptors.

Mad Max is a production of Avalanche Studios, who delivered the chaotic and hyper-fun Just Cause 2, so we're expecting lots of open world fun. Oddly, though, the game is removed from its Australian setting, instead set in a more generic apocalypse - with V8s.

Still, the initial screens show off a game focused on vehicular combat, on foot brawls and shoot-outs, and grim, gritty scenes of desert outposts with people getting kneed in the face. Apart from outrageous Aussie accents, it's pretty much all we could want from one of the most iconic IPs in cinema.

Warner Bros



◀ BATTLEFIELD 4

We liked Battlefield 3 a lot, and it still gets heavy rotation in our non-review gaming time. But there was a lot of valid criticism about the game, such as the fact that one of the elements that made earlier games so popular was missing.

That element was the role of the Commander, the top-down, almost RTS-style command view of the game - and now it's back. Even better, during a full 64-player demo of the game, the Commander role was played out on a tablet - that's pretty damn neat!

And the game itself looks pretty good too, with the Frostbite 3 engine delivering new levels of destruction and ways to take advantage of the environment - like dropping the ground out from under a tank as it rolls over an underground mall. The environments look bigger and more dramatic than ever, too, with more organic spaces and buildings.

This could be the Battlefield fans have been waiting for.

Electronic Arts

► WATCH DOGS

Unveiled to a rapturously appreciative audience at last year's show, Watch_Dogs, the open world hacking and action game from Ubisoft, continues to impress. This year we saw more extended gameplay sequences that show off driving, assisting friendly NPCs via hacked city cameras, and the way the world reacts to your growing notoriety. Most impressive - and possibly alarming, too - is the way the game's multiplayer will work, with each player being able to actively hack and even grief every other player in the city. It could make for a really vibrant and challenging world, or it could just be a playground for idiots.

What's looking more and more obvious is that this is a game that rewards clever use of the environment, and the people in it. You can manipulate things like crash barriers to stop police pursuit, crash the local power-grid to generate cloaking darkness, and generally have a tonne of fun with lots of hacking skills. Or just knee-cap cops who get in the way.

Still, it's a game we'll be drooling over come November this year.

Ubisoft



Consumer privacy through the prism of surveillance

ROSALYN PAGE LOOKS AT THE IMPLICATIONS OF UNIVERSAL SURVEILLANCE



We're living in a post-PRISM world, where we now know the intentions of the US government to grant itself access to our personal information from internet and tech giants like Facebook, Google, Microsoft, Yahoo and Apple. It begs the question of what it means to have privacy.

The very definition of the word might need to be re-written for internet users in the 21st century. It was once a solid concept, but it's been sold off in bits and bytes since we first started using the internet.

Privacy has been redefined, eroded and fundamentally altered in the digital era. It all started when we got a Hotmail address for free and realised that we'd have some advertising signature applied to it and our email recipients would get this free plug whether we liked it or not. This was the first giddy flush of love with free internet services.

Then we rushed to Google and started searching for all and sundry and that was followed by Facebook where we willingly uploaded details about our schooling, previous employers and family connection. We turned to Twitter to share links to our favourite stories or campaigns and then snapped and shared our photos on Instagram. Along the way, many of us set up blogs and started sharing stories about our lives, our political persuasions and many other things.

We've handed over more information about ourselves than we'd share if someone asked us to put it all on paper and hand it to the government. The ease with which we can share and communicate through technology seems to have dulled our natural instincts to protect ourselves.

We've now all got a fair understanding that our web searches are saved and, if you're using Google, this information is used to serve up



▲ PRISM is the NSA's web snooping operation that got outed last month



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

ads based on our interests. Searching for a pizza restaurant? Look out for the Dominos ads that will quickly show up. The same goes with Facebook. So much of our personal information is available and it can be captured through our own profiles and also through the profiles of our Facebook friends. Talking about Thailand on Facebook? Look out for the ads from airlines or Thai tourism that start to appear.

Technology has become intertwined with our lives in every way and there's no doubt it's made life more interesting and created incredible channels for contact with others. At the same time, all of these pieces of data are available for collection and mining.

The revelations that the US government has been engaged in global datamining through its Boundless Informant program that collects billions of pieces of communications metadata and Prism, which is a computer program that collects communications information from service providers, revealed that it's not just marketers and advertisers trawling our data.

In Australia, both sides of government want to strengthen mandatory data retention schemes so that telcos, internet providers and social media services would collect

and store metadata for two years. Labour tried but failed to introduce new laws and the Coalition has said it will examine them if it's in government after the election.

The Greens launched a get a warrant campaign in June to highlight the need for laws that require permission for access to personal metadata and other communication information. Law enforcement agencies made almost 300,000 requests for telecommunications data in 2011-12 without a warrant or legal permission. If you have a mobile phone and an internet connection that's your data that's being collected and potentially made available without checks and balances to weigh up your right to privacy against the need for security and policing. In the US, at least one lawsuit has been launched for breach of privacy.

It's obviously too late to wind back the clock when it comes to using the internet and communications services. Your data is already in the storehouses of information amassed by all the online services that you have used.

As the Prism revelations settle we'll see if we demand better transparency about how and where our personal data is gathered and how and to whom it can be shared.

And what about Google, Facebook and the others? It would be good to see them publish a list of data requests they received and how they responded as part of their privacy policy, so we know that our electronic lives are up for grabs with advertisers as much as government.

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50

ESSENTIAL APPS

JENNETH ORANTIA GATHERS THE MUST-HAVE APPS FOR YOUR PHONE, ACROSS A RANGE OF ECOSYSTEMS, AND LOOKS AT THE BEST PRICING PLANS FOR AUSTRALIAN SMARTPHONE USERS.

If you're new to the smartphone market, this whole new world of apps and power could seem more than a little overwhelming.

And you know what - it can be!

Thankfully, you've got a handy guide right here that will see you through the many thousands of apps spread over various stores and marketplaces, and provide you with essential tools to make the most of the power now in your hand.

Even if you're an old hand with a smartphone, we're sure you'll still find a surprise or two inside.

We've grouped our app choices into sections based on news, social media, photography, utilities, productivity, lifestyle, gaming, travel and navigation.

Apps are only part of the challenge of making the most of your phone, however, so we also take a look at the best phone plans for a couple of the more popular devices, and for a range of different usage patterns.

So whether you're a chatter-box who needs to be in constant contact with friends, or are looking for a good business solution, we've got the best plans for you.

So read on - there's an app for that...

News

FEEDLY

IPHONE, IPAD, ANDROID

FREE

Feedly makes it child's play to juggle the dozens of websites and blogs you read on a regular basis. Stories are formatted into attractive 'cards', and you can sync your Feedly account across supported devices. If you install it before 1 July, you'll also be able to seamlessly migrate your Google Reader account before it shuts down for good.

PULSE

IPHONE, IPAD, ANDROID

FREE

Keep your finger on the pulse (geddit?) with the beautifully-designed Pulse app, which displays all of your favourite news, blogs and social media sites as a series of thumbnail images that you can scroll through horizontally. Offline caching support lets you read stories even when you don't have an Internet connection.

FLIPBOARD

IPHONE, IPAD, ANDROID

FREE

Not a fan of digital magazines? You may reconsider once you check out Flipboard. This app creates your very own personalised

magazine out of the topics you specify, with support for all of your personal accounts such as Facebook, Twitter, Instagram, Tumblr and LinkedIn. You can even create magazines out of content you pull from your Flipboard feed and online and share them with friends.

ZITE

IPHONE, IPAD, ANDROID

FREE

What if an app was smart enough to learn from your reading habits and offer up other content you'd be interested in? That's the premise behind Zite, a clever news-reading app that scours millions of articles daily. With over 40,000 topics to choose from and a Flipboard-style magazine layout, Zite is second to none for staying on top of the latest news in specific categories.

UMANO

IPHONE, ANDROID

FREE

If you prefer to hear your news rather than read it, Umano is the perfect app. It takes the latest news from a variety of top news sources, such as Reuters, GQ, Forbes and Wall Street Journal, and uses trained voice actors to read them out. You can download articles to listen to them offline, and you can also make playlists out of articles you want to listen to.

photography-loving power users. Some of the options that you won't find in other apps include voice-activated shooting, support for customising all of the hardware buttons on your mobile device with camera functions, and the ability to edit famous people into your photos.

FILTERSTORM

\$4.49

IPHONE, IPAD

Until Adobe gets around to developing a touch version of Lightroom, Filterstorm is as good as it gets for batch processing images and applying sophisticated edits from your iPhone or iPad. Only serious/experienced image editors need apply, as the powerful desktop-like tools like layers, brushes and masks are a little advanced for everyday users.

SNAPSEED

IPHONE, IPAD, ANDROID

FREE

The gesture-based controls are a little quirky, but once you conquer the short learning curve, you'll be rewarded with all the tools you need for editing and enhancing your mobile snaps. A simple one-tap control lets you see the "before" and "after" versions of your photos, and the sliders make it easy to control the strength of each effect.

▼ If you read a lot of blogs and websites each day, Feedly can make your life a lot easier



Photo

INSTAGRAM

IPHONE, ANDROID

FREE

There are other apps that offer more filter effects for your photos, but none of them come close to matching Instagram's vibrant 100-million-strong community, which counts Jessica Alba, Justin Bieber and Zooey Deschanel among its users. Instagram also makes it easy to share with other social media services such as Facebook, Twitter, Tumblr and Flickr.

CAMERA AWESOME

IPHONE, IPAD

FREE

This app does just what it says on the box, transforming the fairly average iOS camera interface into something with all the bells and whistles. Shooting options such as burst, timer and composition guidelines are paired up with dozens of cool presets, filters and special effects that you can apply to photos after you've snapped them.

CAMERA ZOOM FX

ANDROID

\$2.59

Camera Zoom FX leaves nothing off the features list, making it the ideal app for



▲ Instagram, left, isn't just for hipsters taking ironic photographs of food or clothing. Camera Awesome, right, adds a lot more functionality to your iPhone's camera

Utilities

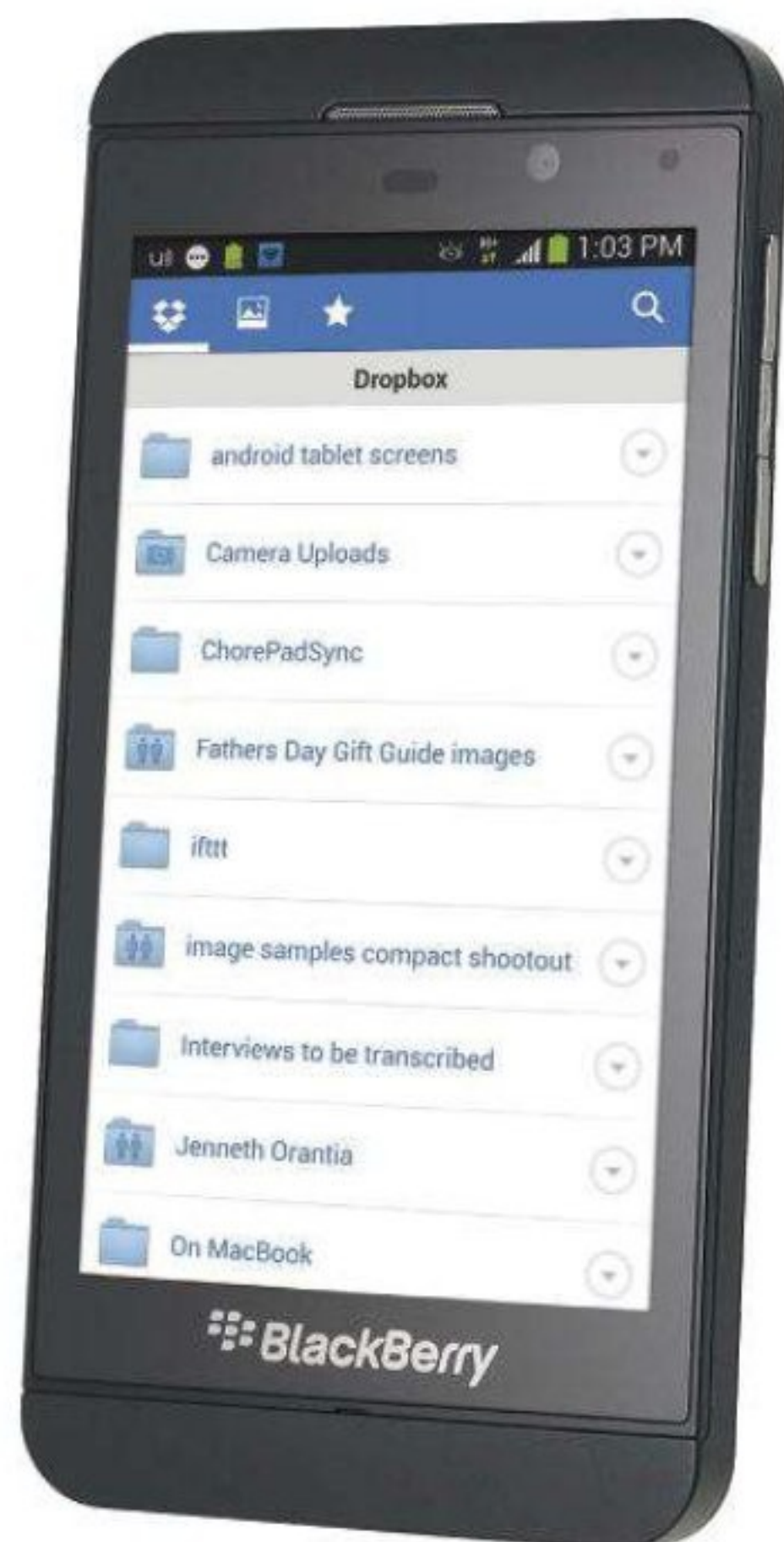
DROPBOX

IPHONE, IPAD, ANDROID,

BLACKBERRY

FREE

Dropbox has a few neat tricks up its sleeve. It can automatically save backups of any photos and videos you shoot to your Dropbox account, and you can use it to sync important files between your devices, including your desktop computer, as well as share files with



▲ Dropbox is essential for being able to access documents and images from anywhere

other users. A free account comes with 2GB of storage, and you can 'earn' up to 3GB more with referrals.

ONAVO EXTEND IPHONE, ANDROID FREE

Can't figure out where all of your mobile data went? Onavo Extend will tell you exactly where it nicked off to by breaking usage down by app and activity. But the real magic of Onavo Extend comes in its ability to stretch your data plan by up to five times, which it does by compressing all of your data downloads.

CHROME IPHONE, IPAD, ANDROID FREE

If you're using Chrome as the go-to web browser on your desktop already, using the mobile client is a no-brainer. It can sync all of your bookmarks, passwords and omnibox data from other devices running Chrome, and it will even open up the same browser tabs so you can continue the same browsing session on any device.

SWYPE KEYBOARD ANDROID 99C

Despite a handful of copycats on the market, the original 'continuous typing' keyboard is still going strong, with a bunch of new features that personalise the experience and

make input a lot faster. If you're not familiar with Swype yet, it's an advanced predictive keyboard that enables you to type whole words without lifting your finger off the screen.

AUTOMATEIT ANDROID FREE

AutomateIt is one of those brilliant apps that really demonstrate the strength of the Android platform. The powerful set of triggers and actions enable you to automate various tasks on your smartphone or tablet, such as putting the ringer on mute every night when you go to bed, and opening the Skype app whenever your mobile device is connected to a Wi-Fi network.

Social

FACEBOOK IPHONE, IPAD, ANDROID, WINDOWS PHONE, BLACKBERRY FREE

It's had its moments, sure, but no app does Facebook better than the official client on each platform. On the iOS and Android clients in particular, you can get close to the exact same experience that you get on the desktop browser, with support for check-ins, photo uploads, event management and groups. You can even use it as the launch point for Facebook apps and games.

FALCON PRO ANDROID \$1.99

Deciding on the best Twitter client for Android is somewhat contentious, but most agree that Falcon Pro has the lead thanks to its slick user interface and comprehensive feature set. Among its impressive list of achievements include support for multiple Twitter accounts, inline previews for images, videos and webpages, and TweetMarker support.

FACEBOOK MESSENGER IPHONE, ANDROID, BLACKBERRY FREE

The next-gen features in Facebook Messenger make SMS look like it was designed in the Stone Age. Wondering whether someone has read your text is a thing of the past thanks to the time-stamped read receipts, while the location-stamping feature gives you the option of telling people where you're sending the message from. It also supports group messaging, voice messages, photos, stickers and emoji.

WHATSAPP MESSENGER IPHONE, ANDROID, WINDOWS PHONE, BLACKBERRY FREE/99C



▲ WhatsApp, left, is a Facebook Messenger app for people without Facebook. Facebook, right, is the biggest social media app on the planet

Don't have a Facebook account? WhatsApp Messenger works off your phone number and offers the same features as Facebook Messenger. Once you give it permission to rifle through your contacts, it will pull out all the people you know that use the WhatsApp service, letting you skip the SMS charges and send unlimited text, multimedia and group messages for free.

HANGOUTS IPHONE, IPAD, ANDROID FREE

Replacing the old Google Talk app on Android, the new Hangouts app (also available for iPhones and iPads) is designed specifically for group conversations that incorporate text, photos and live video calls - although one-on-one chats are supported, too. Support for live videos calls in particular is what separates Hangouts from other social messaging services.

Productivity

EVERNOTE IPHONE, IPAD, ANDROID, WINDOWS PHONE, BLACKBERRY FREE

Evernote is one of those apps that become more indispensable the more you use it. At its core, it's a simple note-taking platform, but the various extras make it much more. Features include server-side OCR so you can do text searches on any images you upload, the ability to share notes with friends and colleagues, and a desktop browser plug-in for clipping webpages to your Evernote account.

PAGES IPHONE, IPAD \$10.49

The word processing options for smartphones and tablets are a trainwreck, to put it mildly, but the Apple-developed Pages app is the one exception. There are plenty of font, colour and formatting options to choose from, over a dozen templates, and iCloud syncing so you

can move seamlessly between supported devices (namely anything with an Apple logo) while you're working on a document.

SHERPA BETA PERSONAL ASSISTANT

ANDROID

FREE
Can't afford a human personal assistant? SHERPA is the next best thing, using your Android device as a control centre for managing your hectic lifestyle. Like Google Now, it tries to predict the information you're after before you ask for it, and it ties into a much wider net of online services and phone functions, including LinkedIn, PayPal and music streaming.

ANY.DO

IPHONE, ANDROID

FREE
Any.DO can bring calm and order to even the most chaotic of task lists, thanks to its simple interface and advanced management features. Tasks, which you can input by typing or voice recognition, are ordered into contexts (such as personal and work) and date, while the time- and location-based reminders ensure that you tick each task off as efficiently as possible.

▼ The Kindle app is essential for bookworms



SPLASHTOP 2 – REMOTE DESKTOP

\$7.49

IPHONE, IPAD, ANDROID

Left an important file on your home or work computer? Splashtop 2 makes it a breeze to access your desktop or laptop using the power of remote access technology. It supports both Windows and Mac computers, and assuming your connection is up to scratch, it's even fast enough to support video streaming and 3D gaming from your smartphone or tablet.

Lifestyle

RUNKEEPER

IPHONE, ANDROID

FREE

Track your walks, runs, hikes and bike rides in style with the high-tech Runkeeper. It's more than a simple counter for measuring pace, distance and calories burned - you can also use it to track exercise and weight loss goals, with training programs built-in to help you achieve specific objectives. If you upgrade to an elite membership, you can even post live maps of your workouts.

KINDLE

IPHONE, IPAD, ANDROID, WINDOWS PHONE, BLACKBERRY

FREE

For the biggest selection of ebooks at the most competitive prices, look no further than Amazon's Kindle app. One of the best things about Kindle, compared to platform-specific readers like Apple iBooks and Google Play Books, is that it's available on every platform, so you'll always have access to your ebook library no matter what device you upgrade to in the future.

POCKET WEATHER AUSTRALIA

IPHONE, IPAD, ANDROID

\$1.99

Weather forecasts aren't the most reliable of beasts, but Pocket Weather is more likely to get it right than most, since it sources information directly from the Australian Bureau of Meteorology. It also offers individual weather for every suburb in Australia and push notifications for severe weather events. The Android version also comes with three homescreen widgets and a lockscreen widget.

ZEEBOX AU

IPHONE, IPAD, ANDROID, BLACKBERRY

FREE

Zeebox adds a social element to the somewhat anti-social pastime of watching TV. As well as a 7-day electronic program guide for both free-to-air and Foxtel, it tells you the hottest TV shows at the moment, and if your friends are signed in with the service, you can also



▲ Soundcloud, left, is the best place to find new music. Pandora, right, lets you create personalised radio stations

chat to them about particular shows and see what they're planning to watch.

JAMIE'S RECIPES

IPHONE, IPAD

FREE

Bit of a klutz in the kitchen? The inimitable Jamie Oliver shows you how to win at cooking, with clear, step-by-step instructions for a variety of dishes. The free app comes with a ten recipe 'taster pack', and you can buy more recipe packs for a couple of bucks a pop, such as 20-Minute Meals Volume 1 and Brilliant Breakfast and Brunch, using in-app purchases.

Multimedia

FOXTEL GO

IPHONE, IPAD

FREE

You don't need to be at home to watch Foxtel. If you're already paying for the service, the Foxtel Go app lets you access 60 live channels (depending on your subscription package) and hundreds of hours of catch-up TV content for no extra charge over a Wi-Fi or 3G/4G connection from anywhere in Australia. An Android client is coming soon.

PANDORA RADIO

IPHONE, IPAD, ANDROID, WINDOWS PHONE, BLACKBERRY

FREE

Pandora is perfect for the times when you want to listen to music but can't be bothered queuing up tracks. Just tell it the name of an artist, song or composer you want to listen to, and it'll create a personalised radio station that plays similar music. Like a real radio station, however, you can't replay tracks, and you can only skip tracks a handful of times per day.

SPOTIFY

IPHONE, IPAD, ANDROID, WINDOWS PHONE

\$12 A MONTH

You'll have to cough up \$12 a month to access it on a mobile device, but the vast catalogue

of over 20 million tracks and various cool playback features make Spotify a worthwhile investment. The 'radio' feature lets you create a personalised station of music similar to a certain song or artist (similar to Pandora), and you can sync as many tracks as you like for offline listening.

TUNEIN RADIO

IPHONE, IPAD, ANDROID,
WINDOWS PHONE, BLACKBERRY
FREE

Remember when mobile phones used to come with built-in FM tuners? Now you can just download TuneIn Radio and access not only the local stations, but thousands of stations around the world as well. The app makes it easy to navigate between different genres of stations, and you can save the ones you listen to most to the favourites tab.

SOUNDCLOUD

IPHONE, IPAD, ANDROID
FREE

Whether you're an aspiring musician or simply someone that loves music, SoundCloud is the place to be for streaming new tunes fresh out of the recording studio. You can follow musicians you like, get notifications whenever they upload new tunes, share tracks and sets with your social networks, and even record and upload music directly from your mobile device.

Games

CLASH OF CLANS FREE

IPHONE, IPAD
FREE

Got a day or two to kill? If you're into combat strategy, you'll happily fall into the time sink that is Clash of Clans, with hours worth of building up resources, defending your village, and bringing your soldiers into battle. There's also an online mode for fighting against real people. Just watch for those pricey in-app purchases - a chest of gems alone will set you back over a hundred bucks.

WALKING DEAD: THE GAME

IPHONE, IPAD
\$5.49 PER EPISODE

In case you weren't disturbed enough already by the TV show, this five-part game series throws you back into the nightmarish zombie apocalypse from the perspectives of new characters. The game is equal parts graphic novel and interactive adventure, and the tough decisions you make in each scene are bound to stick with you long after you've finished playing.

REAL RACING 3

IPHONE, IPAD, ANDROID
FREE

The exquisite detail in Real Racing 3 makes

every other car racing game look like Mario Kart. There's a gorgeous selection of over 45 cars, and the tracks look just as authentic, with locations including the Melbourne CBD and Mount Panorama. The unique 'time shifted multiplayer' feature lets you race against friends even when they're offline.

FIELD RUNNERS 2

IPHONE, IPAD, ANDROID
FROM \$2.99

Your mission, should you choose to accept it, is to once again defend the world from the invading field runners. The bad guys have a whole new bunch of tricks up their sleeve, but then, so do you do. Gorgeous graphics and an excellent AI engine make this one of the best tower defence games of the year.

DEAD TRIGGER

IPHONE, IPAD, ANDROID
FREE

A first person shooter with console-quality graphics and zombies? What's not to like? Dead Trigger has you doing the standard stuff like completing missions and stocking up on weapons, but it's the stunning graphics and soundtrack that really set this game apart. The weapons are pretty cool as well, with 'real' guns like the Colt 1911 paired up with disturbing contraptions like the 'Brain-Mill'.

Travel

GOOGLE TRANSLATE

IPHONE, IPAD, ANDROID
FREE

It's the modern day equivalent of the Babel Fish. For the most common languages, you can simply speak into your smartphone or tablet's microphone and hear the translation a couple of seconds later. 64 languages are supported altogether, but the fact that you need an Internet connection to look up translations makes it harder to use overseas.

▼ XE Currency, left, is handy for travellers or compulsive online shoppers. Trip Advisor, right, is just plain handy for travellers



XE CURRENCY

IPHONE, IPAD, ANDROID,
WINDOWS PHONE, BLACKBERRY
FREE

Keep a close eye on that fluctuating Aussie dollar with the comprehensive XE Currency app. As well as offering simple conversions for every world currency, it includes charts for tracking historic currency rates over time. It also works offline using the last updated rates, and you can use it to monitor up to 10 currencies at once.

TRIPADVISOR HOTELS FLIGHTS

IPHONE, IPAD, ANDROID
FREE

When it comes to researching your next holiday, few sites offer more information than TripAdvisor. The content on offer spans hotels, restaurants, things to do and flights, but the real value comes from the millions of reviews that fellow travellers have posted about each business. If a hotel has poor service or a restaurant has dodgy food, you're bound to read about it here.

TRIPIT

IPHONE, IPAD, ANDROID,
WINDOWS PHONE, BLACKBERRY
FREE

TripIt takes the headache out of planning a holiday by automatically compiling a master itinerary from all of your confirmation emails - a process it can do automatically if you give it access to your inbox. If you upgrade to the Pro subscription (highly recommended for frequent fliers), you'll also get instant notifications if your flight is changed or delayed.

KAYAK

IPHONE, IPAD, ANDROID,
WINDOWS PHONE, BLACKBERRY
FREE

Most people need a holiday just from planning a holiday. Kayak makes it a lot easier to comparison shop for flights, accommodation and car rentals, thanks to the broad range of service providers it covers. The well-designed user interface offers multiple sort and filter options, and once you've found a provider you'd like to book with, you can make reservations directly through the app.

Navigation

GOOGLE MAPS

IPHONE, ANDROID
FREE

Apple may have booted Google Maps from iOS 6, but Google got the last laugh. The redesigned Google Maps for iOS, based on the client built into Android, is a big improvement on the original, adding turn-by-turn navigation, Google local search, and public



▲ Google Maps remains one of the most useful mapping apps

transport information for getting to a place by train, bus or light rail.

WAZE IPHONE, IPAD, ANDROID FREE

Waze adds a social spin to turn-by-turn navigation. It tells you if any of your Facebook friends are heading to the same destination, and you can use it to send friends and colleagues a live ETA, with a link that shows your position as you drive in real-time. It also uses crowd-sourced information for things like traffic, accidents and cheap fuel prices.

NAVIGON AUSTRALIA IPHONE, IPAD, ANDROID, WINDOWS PHONE \$49.95

Navigation apps that download mapping data on-the-fly are a dime a dozen, but the ones that store maps offline are a significantly smaller bunch. Navigon Australia offers all the features you'd expect in a dedicated sat-nav, such as turn-by-turn navigation, a points of interest database, and notifications for speed and red light cameras.

CITY MAPS 2GO IPHONE, IPAD, ANDROID \$1.99

Perfect for cash-strapped travellers, City Maps 2Go lets you download vector maps for any country to your mobile device for no extra charge. The maps include millions of points of interest, as well as Wikipedia entries for nearby sites and attractions, and if you pay a little extra for the Wiki Plus add-on, you can also get your hands on Wikipedia travel guides.

SPEED TRACKER IPHONE, IPAD, ANDROID, WINDOWS PHONE \$4.49

Speed Tracker turns your smartphone or tablet into a sophisticated trip computer. Using GPS, the app can tell you how fast you're currently driving, and there's a built-in 'heads up display' mode that only shows your current speed on the screen. Speed Tracker also gathers the statistics of each trip into a log that you can check back on for work or tax purposes.

FINDING THE RIGHT PHONE PLAN HAVING THE RIGHT APPS IS ONLY PART OF THE PUZZLE!

Between the big three mobile networks, the handful of tier two players, and the dozens of cheap online operators, finding the best mobile plan for your needs can often be more trouble than it's worth. Lucky for you, we've scoured through all of the mobile providers to find the top deals for certain smartphones and user types.

BEST-VALUE PLAN FOR SAMSUNG GALAXY S4

Got your eye on a Samsung Galaxy S4? Virgin Mobile has the best value mid-range plan. For \$61 a month (inclusive of the monthly handset charge) over a 24-month contract, you'll get \$700 worth of calls, unlimited SMS to any network, and 3GB of data. Calls to other Virgin Mobile users are free, and any unused call credit rolls over to the following month.

It certainly doesn't hurt that Virgin Mobile is one of the few mobile virtual network operators that offers 4G (on the Optus network), although look out for that steep excess usage rate of 20.5c a megabyte. Going over your limit by a mere 500MB will set you back over a hundred dollars in excess usage charges. That said, bolt-on data packs are available starting from \$10 a month for 1GB.

BEST-VALUE PLAN FOR APPLE IPHONE 5

Fancy an Apple iPhone 5? Once again, Virgin Mobile offers the best-value plan for mid-range users. It's the same plan as the one covered above for the Samsung Galaxy S4, only it's a little pricier at \$66 a month for the 16GB iPhone 5.

BEST PLAN FOR OCCASIONAL USERS

If you only keep a mobile phone around for emergencies, ALDIMobile, which operates on

the Telstra 3G network, has the perfect Pay As You Go prepaid plan. One recharge, available in denominations of \$15 and \$30, lasts for a full 365 days, and while it doesn't include a bucket of credit like most other phone plans, the call and SMS/MMS charges are miniscule. Calls are charged at only 12c per minute, with no connection fee (most other prepaid plans charge around a dollar a minute), while SMS is 12c each and MMS 35c each. Data is also included at 5c a megabyte. For the \$30 recharge, that works out to be 250 minutes worth of calls.

BEST PLAN FOR CHATTERBOXES

Is your mobile permanently glued to your ear? In that case, an unlimited plan is your best option, as you can literally stay on the phone 24/7 and not have to worry about going over your monthly credit. Kogan Mobile, which also operates on the Telstra 3G network, offers the cheapest unlimited prepaid plans. For either \$29 a month or \$299 a year, you get unlimited calls and texts (including voicemail retrievals, calls to 13/1300 numbers and calls to 18/1800 numbers) and 6GB of data per month. The one caveat is that your data usage is capped to 400MB a day.

BEST PLAN FOR DATA MUNCHERS

You want lots of data and you want it fast. Vaya, which operates on the Optus 4G network, has a great deal for power users. The Power Plan 45, currently discounted to \$36 a month, comes with 3GB of data, along with unlimited calls and SMS. Excess usage is charged at a reasonable 4c a megabyte, and extra data is available via the Power Plus Bolton for \$7 per gigabyte. It's a month-to-month plan, rather than a prepaid plan, but you can cancel the plan at any time.



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1. In tests by AMD as of 28 February, 2013, the AMD Radeon™ HD 7990 showed higher average performance than the NVIDIA® GeForce® GTX 680 in the 3DMark® Fire Strike Extreme (FS6407 vs. FS5336) and Crysis 3 (D980p & 1600p at all quality presets). System configurations: Intel® Core™ i7-3960X (3.30 GHz), MSI X79A-GD65, 16GB DDR3-1600 and Windows 8 x64. AMD Radeon™ HD 7990 evaluated with AMD Catalyst™ 12.2 Beta 6. NVIDIA® GeForce® GTX 680 evaluated with NVIDIA® ForceWare™ 330.30 WHQL. AMD tests were performed on optimized AMD reference systems; PC manufacturers may vary their configuration yielding different results. GRT-32.

2. In tests by AMD as of May 22, 2012 on single-GPU graphics cards, the AMD Radeon™ HD 7970 GHz Edition showed higher average performance than the NVIDIA GeForce GTX 680 in the following games/apps: Formula 1 2010, Civilization V, StarCraft II, Just Cause 2, Unlabeled Heaven, Left 4 Dead 2, Enemy Territory: Quake Wars, The Elder Scrolls V: Skyrim, DIRT 3, The Chronicles of Riddick: Assault on Dark Athena, Crysis Warhead, Metro 2033 (4xAA), and Hard Reset (MCAO). All applications were evaluated at 2560x1600 with SxAA and VAA unless otherwise noted. System configurations: Intel® Core™ i7-3960X (3.30GHz), MSI X79A-GD65, 16GB DDR3-1600 and Windows 7 x64. AMD Radeon™ HD 7970 GHz Edition evaluated with AMD Catalyst™ 12.2 Beta 6. NVIDIA® GeForce® GTX 680 evaluated with NVIDIA® ForceWare™ 330.30 WHQL. GRT-16.

3. AMD Eyefinity technology supports up to six DisplayPort™ monitors on an enabled graphics card. Supported display quantity, type and resolution vary by model and board design; confirm specifications with manufacturer before purchase. See www.amd.com/eyefinity for full details.

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Computex 2013

JOHN GILLOOLY JOURNEYED TO TAIWAN TO CHECK OUT THE STATE OF THE PC INDUSTRY AT ONE OF ITS BIGGEST SHOWS OF THE YEAR

Ever since its inception, Computex has been one of the most important events in the PC landscape. Held every year in Taipei, it is the place where manufacturers come to show off their current, and future, products as well as the place where distributors and retailers come to stock up for the year ahead.

Unlike other shows like CES and Cebit, which pack in a wide array of consumer electronics and industrial products, Computex is focused on the PC. This makes the show a fantastic place to gauge the health of the PC market, and identify the trends and general level of confidence in the industry. It is one of the last places where components take pride of place, and for those that love to tinker and build their own systems, it is a wonderland full of the bits and pieces that will eventually go into the systems we put together.

In recent years we have seen various trends ebb and flow. A few years ago there was an explosion in the number of power supplies on display, more recently it was SSDs that dominated. This year we saw the widespread influence of Intel's new fourth generation processors, and the components designed to drive them.

SMALL IS BIG IN 2013

2013 is also the year in which Mini-ITX is coming of age, thanks to the combination of increasingly more thermally efficient processors and the success of a handful of products released in recent times. Not only did we see an increasing number of highly featured Mini-ITX motherboards (including for the first time an ROG product from ASUS) but also a huge variety of cases inspired by the success of the Bitfenix Prodigy that so enamoured us last year.

The importance of the Prodigy cannot be overstated, as it proved that Mini-ITX could satisfy the needs of power users. It did this by making some calculated compromises in size and weight, without forgetting that the overall design of the case is important for us end users.

Several manufacturers name-dropped the prodigy when showing us their Mini-ITX designs, and thankfully rather than a bunch of me-too solutions, we saw a consistent effort by manufacturers to make their own mark on the Mini-ITX market with a variety of shapes and sizes, from the flamboyant design of Lian-Li's PC-Q30 through to the restrained but powerful HTPC-influenced Silverstone Raven model.

Even ASRock was getting in on the act, collaborating with BMW design to create the M8. This is a barebones PC, packing an ASRock mini-ITX motherboard and coming in a very distinctive chassis. Not only does it feature some fancy touches like a magnetic side panel and OLED-based dial control on the front, but it is capable of fitting a dual height, full-length graphics card as well.

CHERRY PICKING THE NEW TREND

No longer are mechanical keyboards hard to find, with a vast number of manufacturers getting in on the act with models that vary from the subdued to the outrageously flamboyant. Our adventures on the show floor featured quite a bit of keyboard prodding and poking, as we took part in a game of guess that switch.

Whereas last year those companies making mechanical keyboards were focused on one or two switch types, this year we saw an explosion of choice. One of the most interesting things about the mechanical keyboard craze is that the choice of switch is an incredibly personal one. This writer, for example, has a love of red and



◀ CLOCKWISE FROM LEFT: Bitfenix showed a Micro-ATX version of the Prodigy; Corsair has expanded its keyboard range; Cooler Master's stylish Aluminium keyboard



black switches, and a deep loathing of blue ones. Manufacturers are finally realising this, and are putting serious effort into delivering choice to end users.

While we only saw a few interesting new mice at the show, we saw an astonishing number of mechanical keyboards. These included some quite striking designs, such as Cooler Master's new Aluminium model and the production version of EpicGear's Dezimator. But these highly stylish models were vastly outweighed by more traditional keyboard designs. There were ones with and without numpads, and one of the most striking trends was that manufacturers are moving away from loading down their keyboards with macro buttons. Even models that still include macro buttons have a lot less than in the past, an acknowledgement that your average gamer just doesn't use them that often.

TAKING A BLADE TO GAMING LAPTOPS

When you hear the term 'gaming laptops', what instantly springs to mind are the big, wedge-like beasts that are inspired by military hardware and are decidedly unportable. But this year we saw a handful of models that bucked the trend and acknowledged that some gamers actually want to use their gaming laptops as laptops rather than luggable desktop replacements.

There is no doubt that this is a trend inspired by the Razer Blade, one of the most impressive laptop debuts in recent memory. Both Gigabyte and MSI were showing off Blade-inspired models, with seriously powerful hardware under the hood and uncharacteristically restrained designs. MSI was even showing off a concept model that had a small touchscreen in place of the usual touchpad. It was quick to point out that the design we saw is unlikely to enter production, but it was a clear testament to how much of an impact that blade has had upon laptop design.

That isn't to say that this was the only thing of note in the laptop department. While there were few attempts at revolutionary designs, what we did see were manufacturers finally listening to the complaints levelled at Ultrabooks to date. We saw more 1080p screens than ever before, more IPS panels and much more thought given to ensuring that laptops are first and foremost great



▲ CLOCKWISE FROM TOP: Gigabyte's P35K showed just how far it has come as a laptop maker; Antec moves the pump away from the radiator with its new cooler; MSI shows off a Blade inspired laptop



computing devices.

A few quirky designs stood out. It was our first look at Acer's floating hinge design R7, something we aren't exactly sold on but a great example of how we are still seeing active efforts being made to ensure that designs are adapted to make touch interaction more useful. The overall trend still seems to be that a lot of manufacturers are flinging

“The Razer Blade has inspired a trend towards gaming laptops that aren't big, unwieldy wedges...”

everything against the wall and hoping that something sticks in terms of form factor and useability, but it is clear that they are honing in on what works and what doesn't.

COOLER COOLERS

We have seen an ever-expanding number of closed loop water coolers in recent years, and the vast majority of them were made by Asetek or Coolit, with some third party fans and branding slapped onto them. This year marked a pretty major shift

in closed loop design, with several manufacturers proudly claiming that they were using their own custom designs, rather than just licensing them.

The first of these is Antec, which has lifted the lid on a new line-up of products that strive for better cooling through shifting the location of the pump. Traditionally the pump in such coolers sits at the top of the radiator, which acts to restrict the flow of water through the fins. To combat this, Antec's new design puts the pump on the outside, sitting about the fan motor so as to not impede airflow. It has also spaced the fan out from the radiator itself, reducing the cooling dead zone that usually occurs beneath the motor.

Cooler Master has also made serious effort to differentiate itself with an expanded focus on its Eisberg line of coolers. These have been developed in conjunction with German company Eiheim and until now have been restricted to European markets only. They have a very different waterblock design from the standard Asetek models, and we even saw ones that allowed end users to fill them with their own coolant.

Perhaps the most fascinating coolers we saw were at the Silverstone stand. The first was a prototype product that blurred the line between heatpipes and closed loop coolers. Thanks to a special liquid with an extra low boiling point, this unit did away with the pump altogether and instead relied upon convection to circulate heat away from the CPU. As the CPU heats up, the water begins to flow through the tubing, increasing in speed as it increases in temperature. Turn off the PC and the flow begins to subside, slowing down as the CPU returns to

normal temperatures. This reliance on heat makes it a somewhat niche concept - it isn't about making your CPU run as cool as possible, it is about allowing heat transfer to happen with the minimum of noise.

Whilst the passive cooler was very much a concept design, the other closed loop cooler on SilverStone's stand was definitely going into production. Rather than redefine the CPU block, or the pump, this model featured a new custom radiator design. This is inspired by heatpipe-based radiators, and sports thick fins that are more widely spaced than standard radiators. This allows more air to pass through and in turn it should make the unit a lot more efficient when cooling.

OVERCLOCKERS AREN'T GAMERS AREN'T OVERCLOCKERS

Once upon a time overclocking was a way to get a significant boost in performance out of everyday hardware. This isn't the case anymore - everyday overclocking



▲ CLOCKWISE FROM TOP LEFT: Gigabyte's motherboard lineup is now clearly split between gaming, overclocking and mainstream models; Dinos22 flies the flag for Aussie overclockers at Corsair's big Computex OC competition; Thermaltake shows off its BMW designed Level 10 M headphones

will likely eke out a few percentage points more performance, and only really becomes amazing once you go for extreme cooling solutions like Liquid Nitrogen.

Whereas gamers used to need to overclock to eke the most out of their systems, they really don't

"We are finally seeing gaming motherboards that span the entire market, from high end to budget models"

anymore, thanks to the use of boosting techniques on CPUs and GPUs and the sheer gap in power between the PC and consoles. On the other hand, gamers want things that overclockers don't care about, like enough storage space to hold an ever expanding Steam collection and the best quality audio to augment their play.

One of the big things we saw motherboard manufacturers doing this year was separating out gamers and overclockers in their product lines. Apart from ASUS, whose ROG lineup still awkwardly jams LN2 overclocking alongside gaming features, ASRock, MSI and Gigabyte were all showing discreet gaming and overclocking product lines.

Features are still flowing between the product lines, but thanks to the splitting of overclocking and gaming focused products, we are finally seeing gaming motherboards that span from the high to the low end of the market. This means lower end chipsets than the Z87 on motherboards that still retain higher end audio features and multi-GPU support, which means the average gamer might finally be able to move beyond standard motherboards into ones skewed to their specific needs.

HEADPHONES, HEADPHONES, HEADPHONES...

It seemed that every manufacturer we visited was launching a set of gaming headphones. Thermaltake was showing a set of cans designed by BMW, the latest product in a lineup that includes the iconic Level 10 case and mouse. The blocky styling is certainly going to be polarising, and the overall design is quite striking, but they are not only some of the most unique looking ones we have ever seen, but they also feature some interesting features like a locking



▲ LEFT: Func makes a comeback with some very comfortable gaming headphones
ABOVE: Silverstone shows off its first Raven HTPC case, designed to contain a high end gaming PC, complete with graphics card

“There was a huge number of companies spruiking battery-based phone chargers”

AND THE WINNER IS...

By far the most impressive product that we saw on the Computex show floor came from Silverstone (which is incidentally celebrating its tenth birthday this year). While still a prototype, it was actually a reason for PC types to care about Thunderbolt, a small Aluminium tower with a discreet power supply and a x16 PCI-E slot. It is designed to allow you to connect a full-sized graphics card, complete with enough power and cooling to run it. The theory is that you would be able to take a laptop or Ultrabook out on the road and take full advantage of its portability, then use this to turn it into a serious gaming box when you get home.

There are still some things to work out before the tower hits production (Silverstone is looking into other PCI-E externalisation methods to get around the limited bandwidth of Thunderbolt). But the fact that the company is giving this a shot is reassuring in an environment where playing it safe is the status quo. ■

mechanism that keeps them at the right size for your head.

There were also a few companies making their debut into the headphone market, the most notable being Bitfenix, with its colourful soft-touch designs. One of the inherent problems with testing headphones during a massive tradeshow is the amount of ambient noise, but we definitely liked what we heard and look forward to seeing production models.

The other standout set we saw came from a company called Func, which doesn't currently sell into Australia. Some readers will recognise the name for the Func Surface mousepads that it used to sell years ago, but it is now coming out with peripherals as well. These cans were incredibly comfortable, and the large ear surrounds looked perfect for long gaming sessions. Certainly a brand, and products, to keep an eye on.

▼ CLOCKWISE FROM RIGHT: ASRock's first foray into barebones PCs also uses BMW design's talents; Silverstone's amazing Thunderbolt GPU tower; Corsair's new high airflow case in action; Thermaltake's monstrous 40,000mAh battery backup device

number of companies spruiking battery based phone chargers, designed to carry around to top up your smartphone or tablet in times of emergency. We have looked at these kinds of products before (and actually always carry one when we are on the road), but this year we saw some truly monstrous examples.

The most noticeable of these was a 40,000mAh model from Thermaltake's subsidiary Luxa2. Called the P-Mega, this metallic cube is designed for those times when you are away from mains power for some time. It can either charge many devices at once due to multiple USB ports, or pack enough charge to keep you in touch for a week or so out of the office.



ASSAULT ON BATTERIES

There is always one product category that gets an extreme amount of attention during Computex; this time around there was a phenomenal



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The PC endures

DAVID HOLLINGWORTH IS BULLISH ABOUT THE FUTURE OF THE PC, AND DOESN'T GIVE A FIG FOR THIS TALK OF THE SO-CALLED DEATH OF THE PERSONAL COMPUTER

When the statisticians announced a decline in PC sales earlier this year, a lot of folks started talking about it like it was the death of a beloved but long in ill-health relative. It was inevitable, this death of the PC - just look at the inroads tablets, smartphones, and even game consoles have made on that once secure computing space.

Well, I call shenanigans on that.

My colleague John spent some time in Taipei this month, at the giant Computex trade show. He came back more invigorated about the future of the PC as platform than I think I've seen him in years - and we've both been in this game a long time. You can read his views on the show, and on what a new generation of consoles means for the PC, elsewhere in this issue, but what I want to add to the lovefest is what seems obvious to me, but a lot of PC nay-sayers seem not to get.

The PC market - especially the desktop segment of it, of which we are all so fond - has merely matured. I guess it's easy to mistake maturity for moribundity, but let's compare the mobile space, which has just been invigorated by the release of Intel's new Haswell chip, and the desktop.

At the recent Haswell launch, nearly every major laptop-maker in the country was present, showing off a wide range form-factors, from Ultrabooks, to all-in-ones, and everything in between. It was, to coin a phrase, a veritable pre-Cambrian explosion of devices, everyone pretty much throwing form factors at the wall and seeing what sticks.

That's the space that's looking a little uncertain, as devices like the iPad make ground against heavier laptops.

But component makers, I hear, are fiendishly bullish about the PC's future. Sadly, at the Haswell launch, Intel only had one PC builder there - our friends from Scorpion Technology, with a lone desktop. But that's the market that's going well, and that's the market where some fantastic innovation is taking place. The trends of PC sales really don't take that part of the market into consideration, and certainly don't count people like myself - and many of you - who will happily build their own machine, and lovingly upgrade it year after year.

We're not going anywhere - and neither are our machines.

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



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Our A-List award is reserved for the best products in each category we review. If it has this badge attached, you know it's the best thing we've ever seen.



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GOOD
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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 CS5 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.



SMARTPHONE GROUP TEST 48



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MICROSOFT SURFACE PRO

MICROSOFT CONJURES UP A STYLISH, POWERFUL WINDOWS 8 TABLET THAT REMAINS DESIRABLE DESPITE ITS FLAWS, AND MANAGES TO SERVE DOUBLE DUTY AS A LAPTOP AS WELL

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Good things come to those who wait, or so the saying goes, and Microsoft has finally brought its premium Windows 8 device – the Surface Pro – to Australia. It's been available in the US since February, but Microsoft's 10.6in tablet looks to have been worth waiting for.

Although its appearance is similar to its stablemate, the Surface RT, the Surface Pro is a different beast entirely: it swaps Windows RT for Windows 8 Pro, adds the engine of an Ultrabook and tops it all off with a stylus-friendly Full HD touchscreen.

Physically, the Surface Pro is barely distinguishable from the RT, and that's no bad thing – just like its

cheaper sibling, the Pro oozes class. The metallic-grey body feels smooth to the touch, and the combination of chamfered sides and rounded edges make for a device that looks every inch the luxury tablet.

Look a little more carefully, however, and subtle differences begin to emerge. The more powerful components have swelled the casing, and the Pro's 14mm-thick chassis is substantially fatter than that of the Surface RT. Consequently, it's heavier, too, weighing in at 908g. That isn't light by the standards of rival tablets, but the heft goes hand in hand with stunning build quality: no matter how much you twist or squeeze the Surface Pro's chassis, there's barely any flex to be found.

The 10.6in screen is stunningly

crisp. Colours are rich and saturated, viewing angles are wide, and with a brightness of 446cd/m2 and a contrast ratio of 910:1, photos and movies look fantastic. Colour accuracy isn't as good as the finest Ultrabooks we've seen, such as the Dell XPS 13, but it's one of the best screens on a Windows tablet, and the 208ppi pixel density makes for almost-Retina levels of clarity.

CORE HARDWARE

Behind the stunning screen and classy chassis, there's a familiar set of components. The Core i5-3317U processor is one we've seen in many Ultrabooks, and along with 4GB of RAM and an SSD, the Surface Pro feels sprightly by tablet standards. An overall score of 0.63 in our Real World Benchmarks doesn't match the fastest Ultrabooks, but it's more than quick enough for most people's needs. In fact, the only thing we'd wish for is more RAM – as it's impossible to upgrade any of the Surface Pro's components, 8GB of RAM would have been a welcome future-proofing measure.

Peer around the edges, and there's

KEY SPECS

1.7GHz Intel Core i5-3317U • 4GB RAM • 128GB SSD • Intel HD Graphics 4000 • 10.6in 1920 x 1080 LCD • 1 x USB 3 • microSD • mini-DisplayPort • dual-band 802.11n Wi-Fi • Bluetooth 4 • 1MP front-/rear-facing cameras • Windows 8 Pro 64-bit • 1yr RTB warranty • 275 x 172 x 14mm (WDH) • 908g (1.17kg with charger)



▲ Physically, the Surface RT (left) and Surface Pro (right) are barely distinguishable, but inside they're very different beasts



▲ Connectivity is basic, but does include a mini-DisplayPort, a USB 3 port, dual-band 802.11n Wi-Fi and Bluetooth 4



▲ The supplied stylus works perfectly for writing or drawing

sparse connectivity. There's a single USB 3 port, a microSD slot, a 3.5mm headset jack and a mini-DisplayPort output. There's no Ethernet socket, but Microsoft has attempted to make amends by squeezing in dual-band 802.11n Wi-Fi and Bluetooth 4.

We're a little underwhelmed by the front- and rear-facing cameras, however – the meagre 1-megapixel sensors are simply incapable of dredging up the detail of higher-specified rival devices.

Squeezing Ultrabook components into such a compact chassis does have its downsides. Battery life is the most pressing concern, and here the Surface Pro's 42Ah battery struggles. Even with the display brightness dimmed down to 75cd/m2, and Wi-Fi off, the Surface Pro lasted for 5hrs 52mins in our light-usage battery test. Turn on Wi-Fi, raise the screen brightness and start multitasking, and you can expect that to fall sharply.

Another downside of the nippy CPU is that the Surface Pro's slim chassis struggles to stay cool. Indeed, while the sliver-thin cooling vent stretching around the top edge is impressively subtle, the Surface Pro's fans are less

so. Push the processor hard, and the cooling fans spin up with a soft but audible whine, and the metal chassis heats up to match.

In everyday use, though, the powerful components are slick and responsive. Applications spring into life in a blink of an eye, and whether we were scribbling in OneNote or doodling in Fresh Paint, the stylus and Wacom digitiser worked impeccably.

Windows 8's excellent handwriting recognition does an amazing job of recognising the most malformed of squiggles, and, in compatible applications, the Wacom digitiser's pressure sensitivity works well, too. When it isn't in use, the stylus snaps neatly onto the right-hand edge, clipping into the magnetic power socket – it's a lovely little touch.

Splash out on the optional \$149 Type Cover (which works with both the Surface RT and Pro models) and the Surface Pro also does a passable impression of a laptop. We're still not huge fans of the Type Cover's tiny touchpad, but given the excellent stylus and responsive touchscreen, it's a frustration we can live with. And more importantly, as a keyboard it's very usable. The wide, square keys are easy to get used to, and there's just enough travel to make for comfortable touch typing.

In fact, the only downside comes when you want to use the Surface on your lap: as with the Surface RT, the combination of the narrow kickstand, heavy tablet and lightweight keyboard is rather top-heavy. It's manageable but far from comfortable, and we found ourselves wishing we could tilt the kickstand back and forth to adjust the angle at which it sat on our lap.

VERDICT

None of this comes particularly cheaply,

either. While the 64GB model weighs in at \$999, the 128GB model costs up to \$500 more – as much as a fully fledged Ultrabook. And as Microsoft hasn't bundled the Surface Pro with either of the optional Type or Touch covers, you'll need to shell out for one of those, too – unless, of course, you already own a Surface RT, in which case you'll be glad that the covers are interchangeable. And then there's the fact that, with Haswell here, these tablets are now behind the processing curve.

Stop to consider what you're getting, however, and it isn't bad value for money. The hardware is impeccably constructed, the performance strong, and the Wacom digitiser, stylus and Full HD display make for a great combination. The ergonomic irritations in laptop mode, together with modest battery life, mean it won't suit everyone, but the Surface Pro is a great choice for those who want power and full Windows compatibility in such a tiny device.

Sasha Muller

LAPTOP

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



BATTERY LIFE

HOURS:MINUTES



PERFORMANCE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



▼ The narrow kickstand doesn't work well on a lap



TI DELUXE 4770K

THIS HIGH-END DESKTOP PC PUTS THE LATEST COMPONENTS TO INCREDIBLY GOOD USE.

PRICE \$2,395

SUPPLIER www.ticomputers.com.au

It's been quite some time since we've seen two high-end PC component launches at the same time, but last month both Intel and Nvidia launched new high-end products in the lead up to Computex.

While Intel's new Haswell CPUs delivered desktop users a small but noticeable performance boost, Nvidia's new GeForce GTX 780 card delivered a serious jump up in performance (and price) over the GTX 680. We reviewed each of these components individually, but this month we have our first desktop system using both of them.

The system, from Sydney-based OEM Trinity International, packs Intel's top-end Core i7-4770K CPU, a 3GB GeForce GTX 780 card, Gigabyte Z87-D3HP motherboard, 16GB of Kingston DDR3, 120GB Kingston SSD and 2TB Seagate 7200rpm hard drive. It comes in CoolerMaster's CM692 case, which is the USB 3 upgraded version of its iconic CM 690 model and is powered by a 750W Cooler Master PSU.

This is all pretty standard fare, until you realise that the CPU has been overclocked to 4.4GHz, up from the standard speed of 3.5GHz. This has been achieved through the use of a Noctua D14 cooler, a double tower model that is slightly visible through the fan grills at the side of the case. While it isn't in danger of breaking any

records, this is a pretty solid overclock for a retail system.

This overclock translates into a noticeable boost in performance over the standard speed Core i7-4770K. In our testing of that chip last month we saw it hit an overall score of 1.12 in our real world benchmarks. In contrast the TI deluxe system delivers a score of 1.22 in the same testing. The difference between stock and this overclock is most pronounced in the media subtest, where the TI system scores 1.37 as opposed to the standard score of 1.2.

Given that the core i7-4770k is already the best consumer CPU on the planet, this performance boost is largely gravy, but it also makes an impact in our Crysis testing, which we found was starting to be bottlenecked by the CPU not GPU last month.

The combination of the 4770K and GTX 780 see some phenomenal framerates being pumped out in Crysis, with a solid 60fps at very high detail, demonstrating that this system is capable of coping with anything that current games can throw at it. If anything, the performance highlights the fact that the included Samsung S24B300H monitor is acting as a bottleneck to the system.

The monitor tops out at 1920 x 1080 resolution, while this is a system that would shine at the 2560 x 1440 resolution delivered by decent 27in monitors. The 24in Samsung screen

is cheaper but is ultimately a poor pairing, considering the sheer inherent power of the components that go to make up this PC.

Make no bones about it, for high-end video editing and gaming work the TI deluxe 4770K delivers more than enough performance. This also means that it is overkill if such processing-heavy pastimes aren't your forte – in which case you would be just as well served with a lower-end CPU and GPU combo. To get the most out of this PC you will need to skip the included monitor and get something more high-end, which will add to the pricetag.

On the flipside, we cannot see any situation where a system of this sheer grunt will need upgrading over the coming years. Even with a new generation of consoles landing in a few months, the combination of CPU and GPU speed, 16GB of memory and the 3GB framebuffer that comes standard on the GTX 780 is capable of running rings around anything that the rather humble APUs driving the consoles are capable of.

With the inclusion of ample USB 3 ports on the system, and 2TB of bulk storage space (with spare SATA slots to burn on the motherboard), you are set for any storage expansion that you'll need in the near future.

Yet again TI has delivered a system that shows Intel's new CPU in its best possible light, and one well worth the \$2395 price tag that it packs. We would heartily suggest that anyone going for such a PC replace the default monitor with something more impressive, something that will do justice to the system's high-end performance. Apart from that, it is a phenomenally good desktop PC.

John Gillooly



KEY SPECS

Core i7-4770K at 4.4GHz, GA-Z87-D3HP motherboard • GeForce GTX 780 3GB • 16GB DDR3 • 120GB SSD • 2TB 7200rpm HDD; Blu-ray burner; Samsung S24B300H monitor • Windows 8 64-bit

3D SPEED

GOOD PLAYABLE UNPLAYABLE

VERY HIGH SETTINGS	60FPS
HIGH SETTINGS	107FPS
MEDIUM SETTINGS	140.5FPS

BENCHMARKS

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

OVERALL	1.22
RESPONSIVENESS	1.00
MEDIA	1.37
MULTITASKING	1.29

PERFORMANCE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



VENOM BLACKBOOK ZERO PREVIEW

INTEL'S CORE I7-4750HQ WITH TOP END IRIS PRO 5200 GPU TAKES PRIDE OF PLACE IN THIS EXAMPLE OF JUST WHAT HASWELL IS CAPABLE OF IN THE LAPTOP SPACE.

PRICE \$1949

SUPPLIER venomcomputers.com.au

Last month we looked at the desktop version of Intel's fourth generation Core processors, codenamed Haswell. While it delivered the same sort of incremental performance gains that we are used to seeing from Intel's desktop CPUs, it was clear that the real benefits of the new architecture would be seen on the mobile front.

Whereas Intel tends to make its desktop CPUs available from retailers on the day of the new product launch, mobile variants take a month or two to make their way into production laptops. This trend continues with Haswell, and while we have seen numerous products that will use the CPUs, at the time of writing none of them was available to buy.

In order to see just whether or not these mobile CPUs can live up to their promises, we have gotten our hands on an engineering sample from local Laptop vendor, Venom. This system is dubbed the Venom Blackbook Zero, and is a surprisingly powerful unit for its size and weight. It is a 14in model, with a 1920 x 1080 screen, 16GB of DDR3, 240GB SSD and 1TB HDD. It comes in at a mere 20.8mm thickness and weighs only 1.9kg. When the final version ships it will be priced at \$1949.

Hot off the plane from Computex, the really exciting thing about this laptop is that it packs a Core i7-4750HQ CPU with Iris Pro graphics. Not only is this the first mobile Haswell CPU that we have tested, but this model gives us our first chance to see how Intel's new high end integrated GPU performs.

Before we get to performance, it is important to understand Intel's strategy when it comes to its mobile Haswell processors. In keeping with the shift towards mobile as a priority in development, Haswell is available in a multitude of different designs, and variation occurs not only in the number of CPU cores and clockspeeds, but also in the different kinds of integrated GPUs.

With Haswell there are now three major GPU types that Intel includes

in its processors. Intel HD Graphics is the most basic of these, based upon the GT1 design that was seen in Ivy and Sandy Bridge CPUs. Moving up the performance scale we see the Intel HD Graphics 4000 series, which comes in several variants (4200, 4400 and 4600) and is the same as the GT2 GPU seen on higher end Sandy and Ivy Bridge CPUs.

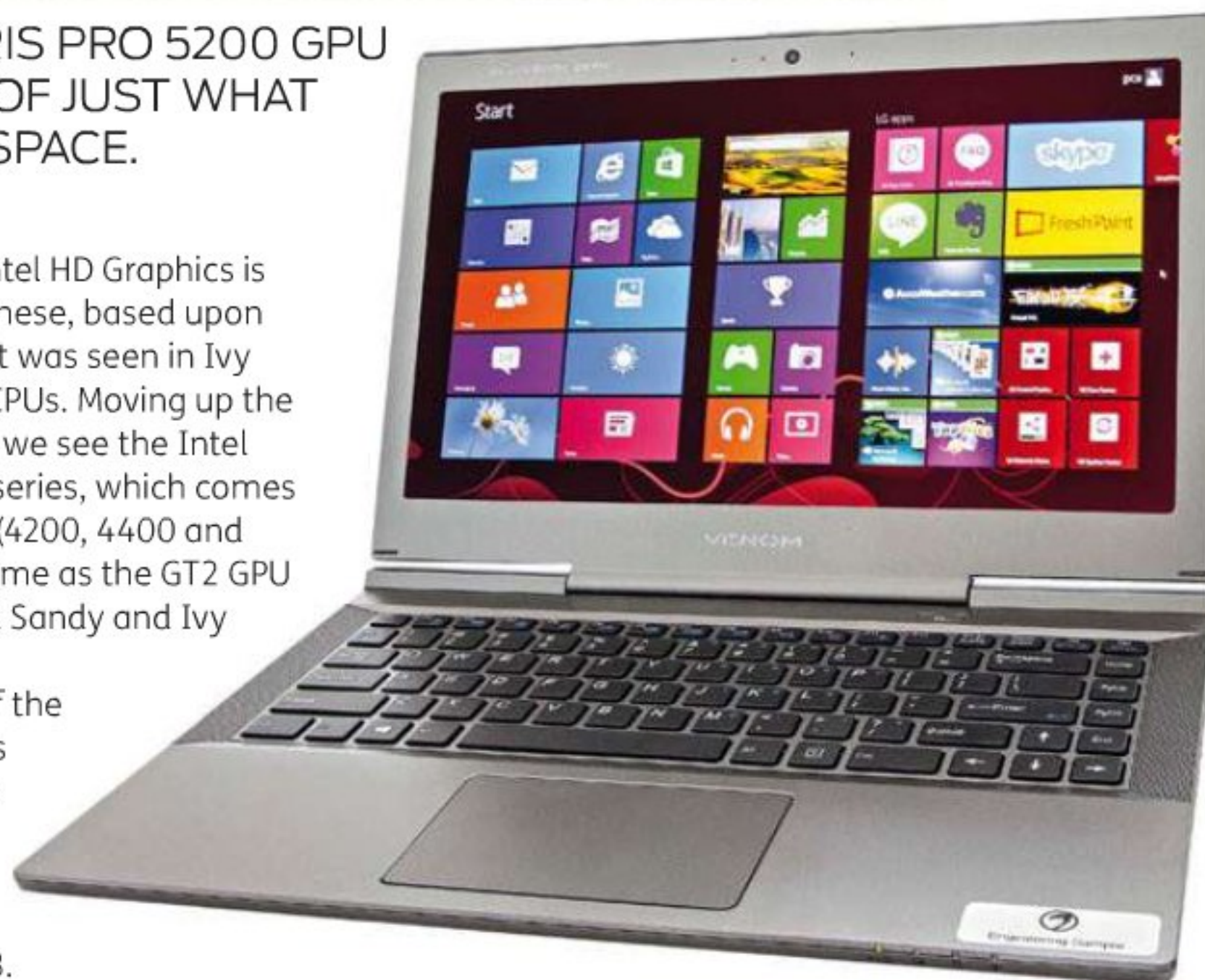
At the top end of the integrated graphics performance scale sit three new GPU designs, all based on a new level of graphics called GT3. This comes in three variants, split according to processor wattage. For 15W (Ultrabook) CPUs there is the Intel HD graphics 5000 GPU, for 28W designs there is the Intel Iris graphics 5100 and at the top of the stack sits the Intel Iris Pro 5200 graphics core, which appears on CPUs with a 47W TDP.

It isn't just the TDP that sets the Iris Pro GPU apart, however. This design features 64MB of embedded DRAM (eDRAM), which effectively acts as an L4 cache for both the CPU and GPU. This enables Intel to squeeze the most 3D and OpenCL performance out of Iris Pro 5200 processors, and helps to make this a significant step up from Intel's traditionally underwhelming integrated GPU performance.

This promise is borne out by our Crysis benchmark, where the Iris Pro managed to deliver a near-playable 27fps at high detail. At medium its framerate was a more than adequate 57fps, indicating that this is indeed a 'good enough' solution for casual gaming, and effectively knocking low-end discreet GPUs off the market.

Not only does the GPU perform admirably, but the CPU performance of the Core i7-4750HQ is also fantastic. In our Real World Benchmarks it managed an overall score of 0.96, which is nearly as fast as our reference Core i7-2600K system.

Being a mobile CPU running at 2GHz, it doesn't quite have the grunt of the equivalent desktop version, but it is damn close and more than adequate for everything but the most

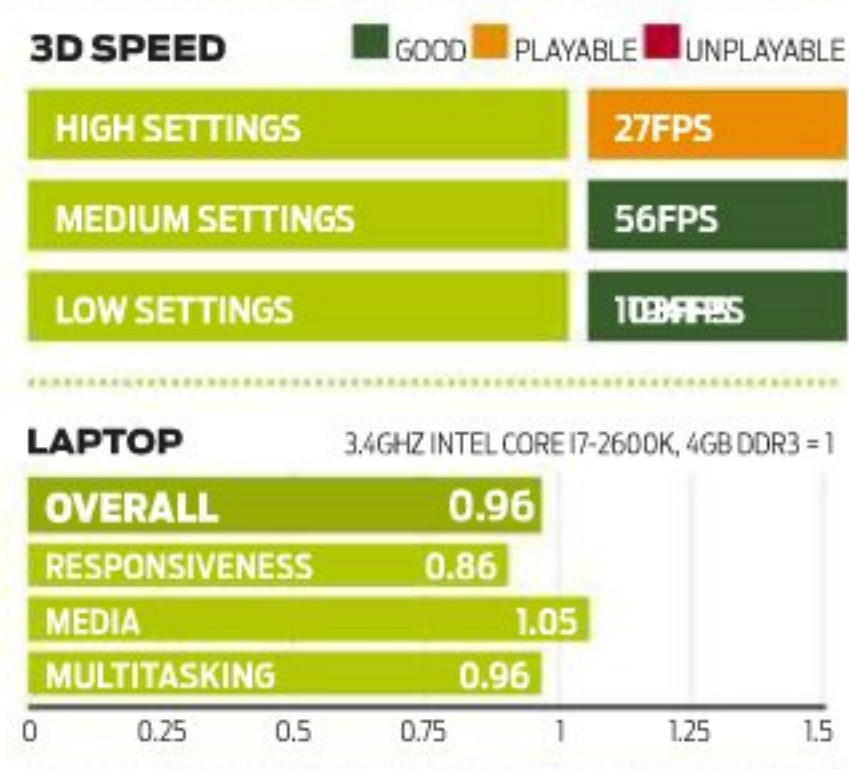


▲ This engineering sample shows remarkable performance for such a thin and light laptop

demanding of tasks. Add to this the fact that it managed to survive for five hours when running our light use benchmark and it looks like it will be a great unit if you want to balance performance with mobility. It certainly doesn't have Ultrabook level lasting power, but it does pack a lot more performance than we expect from the Ultrabook variants of Haswell.

While this is only an engineering sample, the Venom Blackbook Zero offers ample proof that Intel's increased focus on mobile performance is paying off in droves. Not only are we seeing unprecedented levels of integrated GPU performance, but the robust CPU performance is astonishing, considering that we are looking at a laptop that weighs under 2KG and is only 20mm thick. Despite its size, this unit packs enough power for the vast majority of end users, even those who want to engage in some light gaming.

John Gillooly



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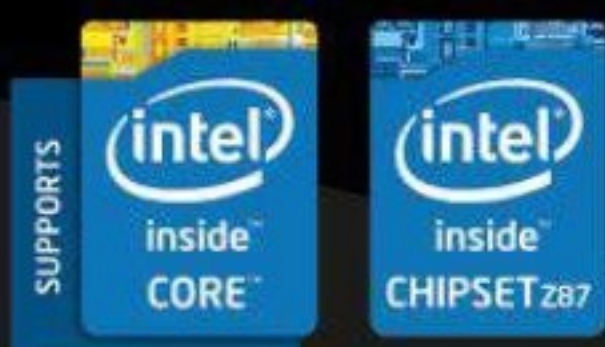
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TOSHIBA KIRA ULTRABOOK

TOSHIBA MAKES A LUXURIOUS STATEMENT WITH ITS NEW KIRABOOK, BUT IS LUXURY ENOUGH?

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

Toshiba, unlike LG, has never left the laptop market, and has been busy pushing Satellites, Qosmios, and Tecras at us for years. Its latest generation of machines includes all of those (and some all-in-ones), and a whole new product family, aimed at elegant and luxurious computing. If it feels like we're saying luxury a lot, blame the launch event, where the word was banded about with gay abandon.

Nonetheless, Tosh does have a point. The KIRA is undoubtedly attractive, designed with subtle metallic tones, and with simple curves adding an understated grace to the product. It also sports the full Ultrabook spec, and a reasonably grunty Core i7 processor backed up by 8GB of RAM, and a relatively roomy 256GB SSD.

However, all that does come at a seriously luxurious price point. At \$2199 –

that's \$800 more than the LG Z360 – you are getting more raw tech, and a screen with an amazing resolution for its size. 2560 x 1440 is nothing to sneeze at.

But why would we prefer the Z360 out of the pair? We like style as much as the next technophile, possibly even a little bit more, but at the end of the day we feel you're just not getting \$800 worth of luxury. Despite having a higher core spec across the board, the difference in performance in our benchmarks was negligible, and while the KIRA has a tonne of resolution, the IPS display on the Z360 is simply better to look at. Colours on the KIRA seem oddly muted, and the extra sharpness is simply wasted at this screen size. The larger storage is certainly welcome, and it feels very good to use day-to-day. The keyboard is well-made, the trackpad highly useable, and overall you are getting a high build quality. There's really nothing wrong with the KIRA, it's just that the high asking price makes it compare poorly.

Combined with how much noise

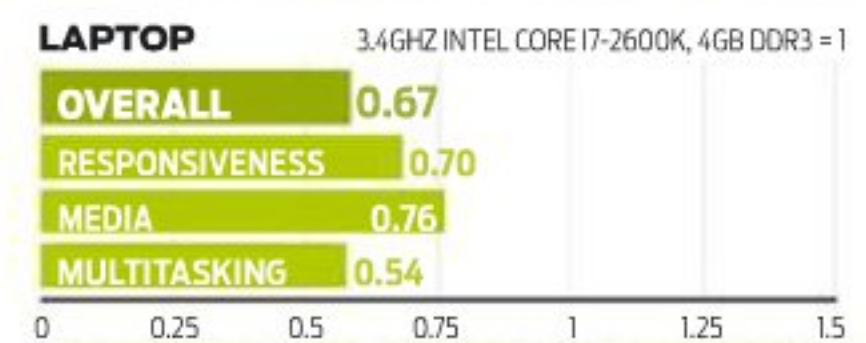


KEY SPECS

Intel Core i7 3537U processor @ 2GHz • 8GB DDR3 1600MHz RAM • 256GB SSD • Intel HD 4000 graphics • 13.3in LED display (2560 x 1440) • 3x USB 3, 1x SD card, 1x HDMI, 1x audio • 316mm x 207mm x 19.8mm • 1.35kg.

the KIRA makes in operation – the whine from the Ultrabook's fans nearly drove our designer to distraction – it becomes a hard unit to recommend. Save the money, and go with the Z360. Or ditch the constraining Ultrabook spec altogether, and go with Venom's excellent Haswell machine.

David Hollingworth



LG Z360 ULTRABOOK

A VERY UNASSUMING, BUT NONETHELESS VERY IMPRESSIVE, RE-ENTRY INTO THE LAPTOP SPACE FROM LG.

PRICE \$1399
SUPPLIER www.lg.com.au

LG's been off gallivanting with the television and mobile phone crowd, but has at last decided now is the time to get back into the laptop business, along with a couple of entries into the tablet and hybrid space. We'll look at those next month, but for now, we're focusing on the curiously timed Z360 Ultrabook.

We say curious, because LG launched this entire range of devices while Computex was happening in Taiwan (read more about that on [p.26](#)), and while Intel was loudly announcing the world's worst-kept secret – the fourth generation of its Core series of processors, up to now codenamed Haswell. Now that those chips are out, third-gen machines, like this one, are technically a whole processor generation out of date.

So how does the Z360 stack up in a soon-to-be Haswell-dominated space?

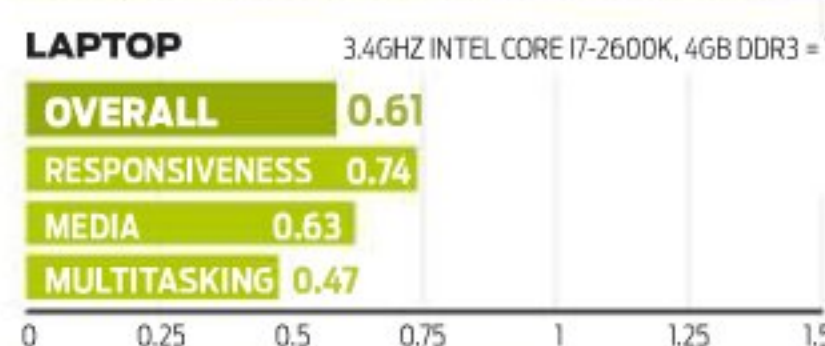
Well, the short answer is very well, and

KEY SPECS

Core i5 3337U @ 1.8GHz • 4GB DDR3, 1600MHz RAM • Intel HD 4000 graphics • 128GB SSD • 13.3in IPS LCD (1920 x 1080) • 2x USB3, 2x MicroSD, 1x audio, 1x RJ45, 1x HDMI • 314 x 219 x 13.6mm • 1.15kg • Windows 8 64-bit.

that if you're looking for a well-priced Ultrabook, this is possibly one of the best on the market. The long answer is that for \$1399 LG has come up with a cleverly specced, well-designed machine, all cased in elegant white polycarbonate (basically plastic, but hey), and with a fantastically bright and clear screen. Given that asking price, it's a very attractive option, and it's thin and light enough to be a truly mobile device.

Its keyboard is a touch cramped (as our large-handed editor found out), but for most it's going to be a pleasure to type on, with specialised Windows 8 keys down the left-hand side. The touchpad is a bit more problematic, offering no feedback on clicking, but you can get used to it.



In this form factor you're not really expecting up to date grunt, though the heat management and battery life that Haswell offers will be welcome when it inevitably finds its way into the range. Despite the lesser spec, the Z360 is on a par with the more expensive KIRA, and in some cases actually better. LG's hardware choices are far smarter – and cheaper.

As it is, the Z360 is welcome return from LG, and a low-end Ultrabook that we'd be happy to call our own.

David Hollingworth



INTERNAL HARD DISKS

MECHANICAL HARD DISKS OFFER HUGE STORAGE SPACE WITHOUT THE PRICE TO MATCH. WE TEST FOUR BIG-BRAND MODELS

SEAGATE BARRACUDA 7200.14

PRICE \$139 **SUPPLIER** www.seagate.com.au

Seagate's Barracuda 7200.14 is frequently found in the desktop PCs we review, and it's no mystery why: in our tests, it delivered an impressive set of benchmark results, helped by a combination of a 7200RPM spindle speed and a cache of 64MB.

Its AS SSD sequential read result was the joint-quickest in this test, and its write speed made it a decent runner-up.

In CrystalDiskMark's sequential read and write tests, the Seagate recorded respectable second-place scores that were slivers behind its nearest rival, the Toshiba DT. Its

512KB read result was all but identical to that of the Toshiba, too, and it was a similar story when reading 4KB files. When it came to writing small files, however, the Barracuda pulled ahead: its 512KB pace was the joint-fastest here, and it beat the Toshiba comfortably in the 4KB tests.

The Barracuda 7200.14 is the second cheapest drive we tested – it works out at 7c per gigabyte. Whether you need lots of storage or an all-round performer, it's a good choice, but not the best on the market.

OVERALL ★★★★★☆

TOSHIBA DT

PRICE \$129 **SUPPLIER** www.mytoshiba.com.au

Toshiba bought Hitachi's hard disk assets from Western Digital last year, so this drive is actually a relative of the Labs-winning Hitachi model from our last storage Labs.

That's a good pedigree, and it showed in our benchmarks. The Toshiba's AS SSD sequential read and write results were the best on test, and the Toshiba led the way in CrystalDiskMark in all three of our file-reading benchmarks. It was also the quickest on test at writing sequential files.

Unfortunately, the Toshiba falls down when it comes to

writing smaller files, perhaps because of its comparatively small 32MB of onboard memory, which is half the size of its rivals' caches.

The DT's 512KB write result was this month's worst, and the drive also came last in the 4KB benchmarks, achieving less than half the speeds of its rivals.

At \$129, the Toshiba is cheaper than the Seagate, and it's pretty fast on most areas. It's a tough call to make, but for overall speed and having the cheapest per-gigabyte cost on test, we think this is the winning drive.

OVERALL ★★★★★★

HOW WE TEST

The figures in the table opposite show selected results achieved using the CrystalDiskMark and AS SSD suites of hard disk benchmarks. The sequential figures indicate performance with large files, and the 512KB and 4KB figures show how each of the disks perform with smaller files.

WESTERN DIGITAL CAVIAR GREEN

PRICE \$159 **SUPPLIER** www.wdc.com.au

The Caviar Green is the largest disk here, with a 3TB headline capacity that equates to 2.7TB of usable space.

It's an energy-efficient drive, with a typical power consumption of around 6W when active. By comparison, Western Digital cites an active power draw of around 11W for Black drives.

This power saving is achieved partly by spinning the disk more slowly than the standard 7200RPM. Not surprisingly, this has a detrimental effect on speed. In AS SSD, the Green's sequential read and write scores placed it in the bottom half of our results table, and equivalent

CrystalDiskMark tests were also disappointing.

Performance didn't pick up when handling smaller files, either. In CrystalDiskMark's 512KB and 4KB file read tests, the Green was rooted to the bottom of the table. When writing 512KB files, it placed third out of the four drives in this test.

Although the Caviar Green isn't built for speed, it does offer the best value here, at only 5c per gigabyte.

If you prize capacity over performance, then the Caviar Green is a good alternative to the award-winning Toshiba.

OVERALL ★★☆☆☆☆

WESTERN DIGITAL CAVIAR BLACK

PRICE \$169 **SUPPLIER** www.wdc.com

Caviar Black is Western Digital's high-performance hard disk brand. The 2TB model is a 7200RPM drive with a 64MB cache, and the firm claims there are a number of technological advances that put the drive ahead of the competition, such as "twin processors" and improved caching algorithms aimed at improving speeds.

In our tests, these didn't translate into impressive benchmark results. The Black's sequential read and write scores in AS SSD were the worst here, and it also came last in CrystalDiskMark's sequential tests.

The Western Digital hit mid-table

when reading 512KB files, and it was the quickest hard disk when reading 4KB files, with a fractionally faster result than the Toshiba. It only excelled when writing small files: in CrystalDiskMark's small-file tests, it was the fastest drive here.

That's little comfort in the face of slow performance elsewhere and a high price – at \$169, the 2TB Caviar Black is by far the most-expensive and poorest-value drive in this test, working out at 8.5c per gigabyte.

In our tests, it simply didn't live up to its high-performance promises, which means we can't recommend it.

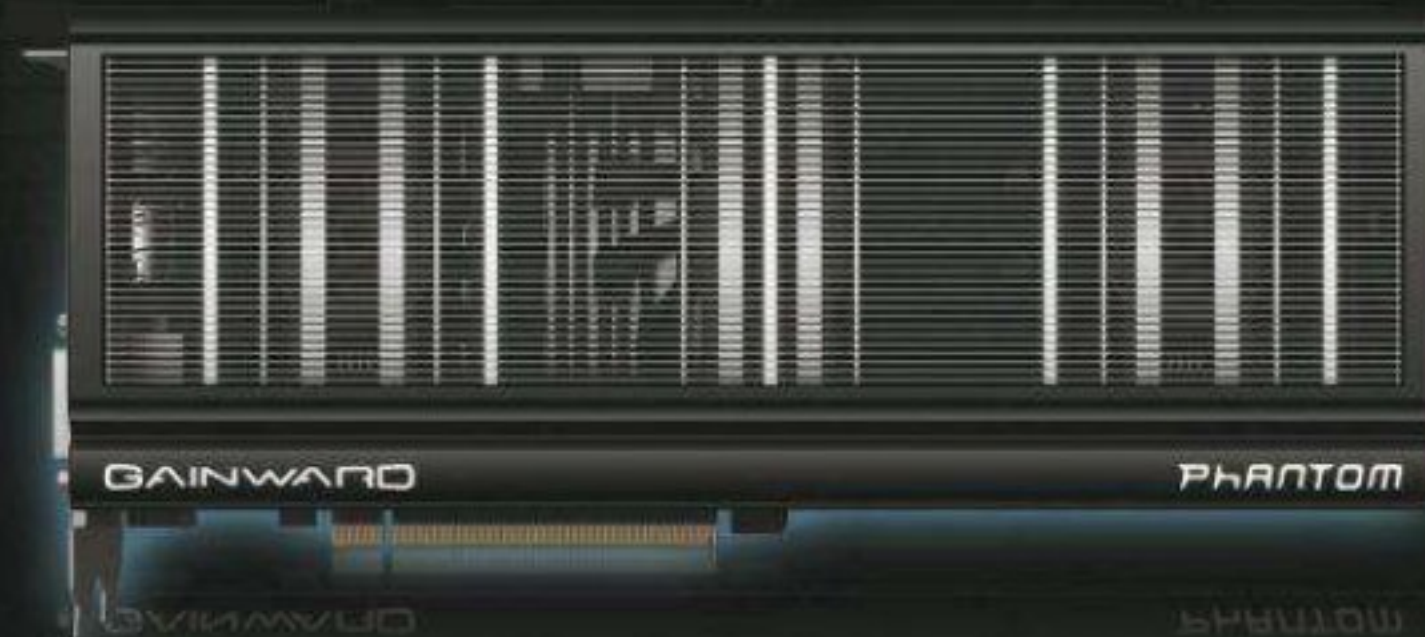
OVERALL ★★☆☆☆☆

HARD DISK BENCHMARKS, PRICES AND SCORES

	CRYSTALDISKMARK						AS SSD				
	Seq. read	Seq. write	512KB read	512KB write	4KB read	4KB write	Seq. read	Seq. write	Price	Price per GB*	Score
Seagate (2TB)	185MB/sec	182MB/sec	58MB/sec	92MB/sec	0.68MB/sec	1.44MB/sec	175MB/sec	136MB/sec	\$139	7c	★★★★★☆☆
Toshiba (2TB)	187MB/sec	183MB/sec	61MB/sec	85MB/sec	0.73MB/sec	0.7MB/sec	176MB/sec	146MB/sec	\$129	6.5c	★★★★★☆☆
Western Digital Caviar Green (3TB)	157MB/sec	153MB/sec	48MB/sec	90MB/sec	0.59MB/sec	1.44MB/sec	148MB/sec	134MB/sec	\$159	5c	★★★★★☆☆
Western Digital Caviar Black (2TB)	139MB/sec	136MB/sec	55MB/sec	92MB/sec	0.73MB/sec	1.83MB/sec	132MB/sec	122MB/sec	\$169	8.5c	★★★★★☆☆

GAINWARD

PHANTOM



GEFORCE GTX 770

GEFORCE GTX 780

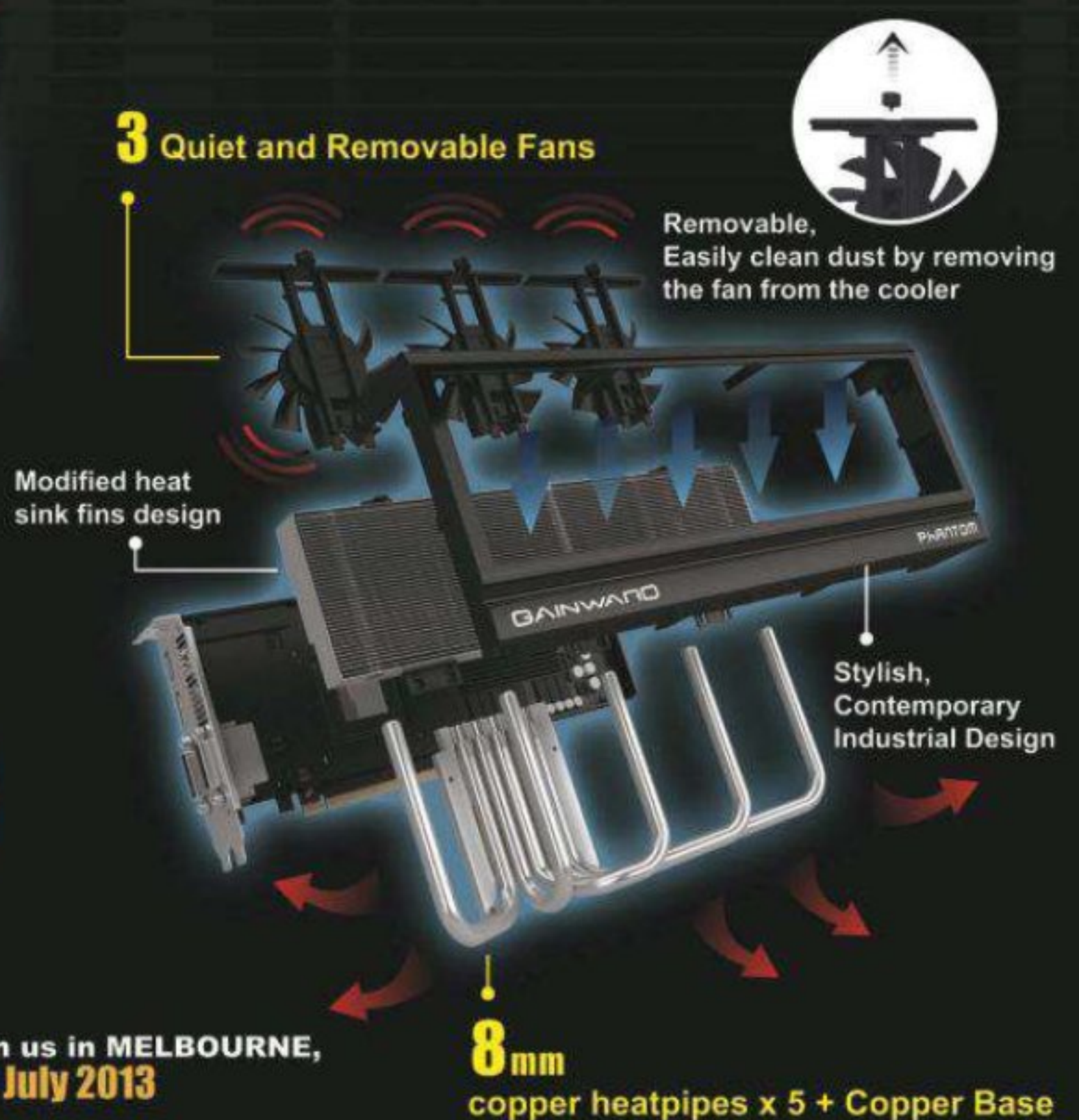


EXPERT MODE



Enable extra OC capability for Hardcore players

* Noted! Overclock may void your warranty.



Gainward to PAX in 19 July. This winter join us in MELBOURNE, from 19 to 21 July 2013



SONY XPERIA TABLET Z

A SUPER-THIN TABLET, BUT TOO EXPENSIVE TO REPLACE THE NEXUS 10 IN OUR AFFECTIONS

PRICE 16GB \$539, 32GB \$649
SUPPLIER www.sony.com.au

Full-sized Android tablets have been thin on the ground of late, with manufacturers concentrating instead on shoving out cheap, compact tablets by the dozen.

As such, the Sony Xperia Tablet Z is a breath of fresh air. It's the first 10in Android tablet we've reviewed since the Nexus 10 – our current favourite Android tablet at this size – and it's a stunner.

The first time we picked it up, it seemed impossibly thin and light. Incredibly, it's thinner than an iPhone 5, and you'll barely notice its 495g weight when it's in your bag. Its squared-off, angled edges and flat glass panels at the rear and front ooze class, and

like its smaller companion, the Xperia Z smartphone, the Tablet Z is water- and dust-resistant, with sealed flaps covering all its ports.

In a spec-for-spec comparison, the Tablet Z doesn't match up with the Nexus 10. Its 1920 x 1200 resolution is lower than the Nexus 10's 2560 x 1600, and while the Nexus runs the latest version of Android Jelly Bean at 4.2, the Tablet Z is stuck on 4.1.2. It also costs \$70 more than the Nexus.

Otherwise, the Tablet Z has much the same feature set, with 16GB of storage and a microSD slot for expansion, dual-band 802.11abgn Wi-Fi, NFC and Bluetooth. Its quad-core 1.5GHz Snapdragon S4 Pro processor helped the Tablet Z achieve a strong Quadrant score of 7413, but its SunSpider result of 2074ms was much slower than the

KEY SPECS

1.5GHz Snapdragon S4 Pro quad-core CPU • 2GB RAM • 16/32GB storage • 10.1in 1920 x 1200 IPS LCD • dual-band 802.11abgn Wi-Fi • Bluetooth 4 • NFC • 8.1MP/2.2MP rear/front camera • microSD slot • 6000mAh battery • Android 4.1.2 • 1yr RTB warranty • 266 x 6.9 x 172mm (WDH) • 495g

Nexus 10's.

In practice, the Tablet Z handled all the tasks we asked of it during testing, and played demanding games such as Real Racing 3 smoothly. But given the price premium over the Nexus 10, you're entitled to expect more. We'd hoped to see better battery life and a more vivid screen, but the Tablet Z disappointed on both fronts, with a score of 9hrs 11mins in our looping video test, a maximum brightness of 370cd/m2 and a contrast ratio of 787:1 – all short of the Nexus 10's results.

The Xperia Tablet Z has an 8.1-megapixel camera at the rear that produces reasonable snaps and 1080p video at 30fps. It tends to blow out highlights a little too easily in bright light, and it isn't great in low light, but it's fine for the occasional shot when the tablet is all you have to hand.

Embedded in the top edge of the tablet is an infrared transmitter, allowing the Tablet Z to be used as a universal remote control. We found setup a little hit and miss, but once we'd figured out which profile to use with our TV and set-top box, it worked perfectly. The remote control app can be used in full-screen mode, or you can bring up a pop-up control that sits on top of whichever app is currently running, making channel-hopping a breeze.

Although the Tablet Z doesn't run the very latest version of Android, we rather like what Sony has done with its user interface overlay. The custom keyboard, which responds to each keypress with a light tinkle, exhibits no lag. The pop-up quick apps panel, launched via a small icon in the soft-button bar at the bottom of the screen, is another nice touch, as is the way the app drawer can be re-ordered to suit your own whim. You also have the ability to "throw" currently playing video or music to DLNA-compatible devices from Sony's proprietary media software.

Is all this enough to make up for the high price? The answer has to be no. We enjoyed using the Sony Xperia Tablet Z, but it's 25% more expensive than the Nexus 10, and while it boasts a more elegant design and tougher construction, it fails to compete with that device's screen or its battery life. In short, the Tablet Z isn't good enough to justify the extra cost.

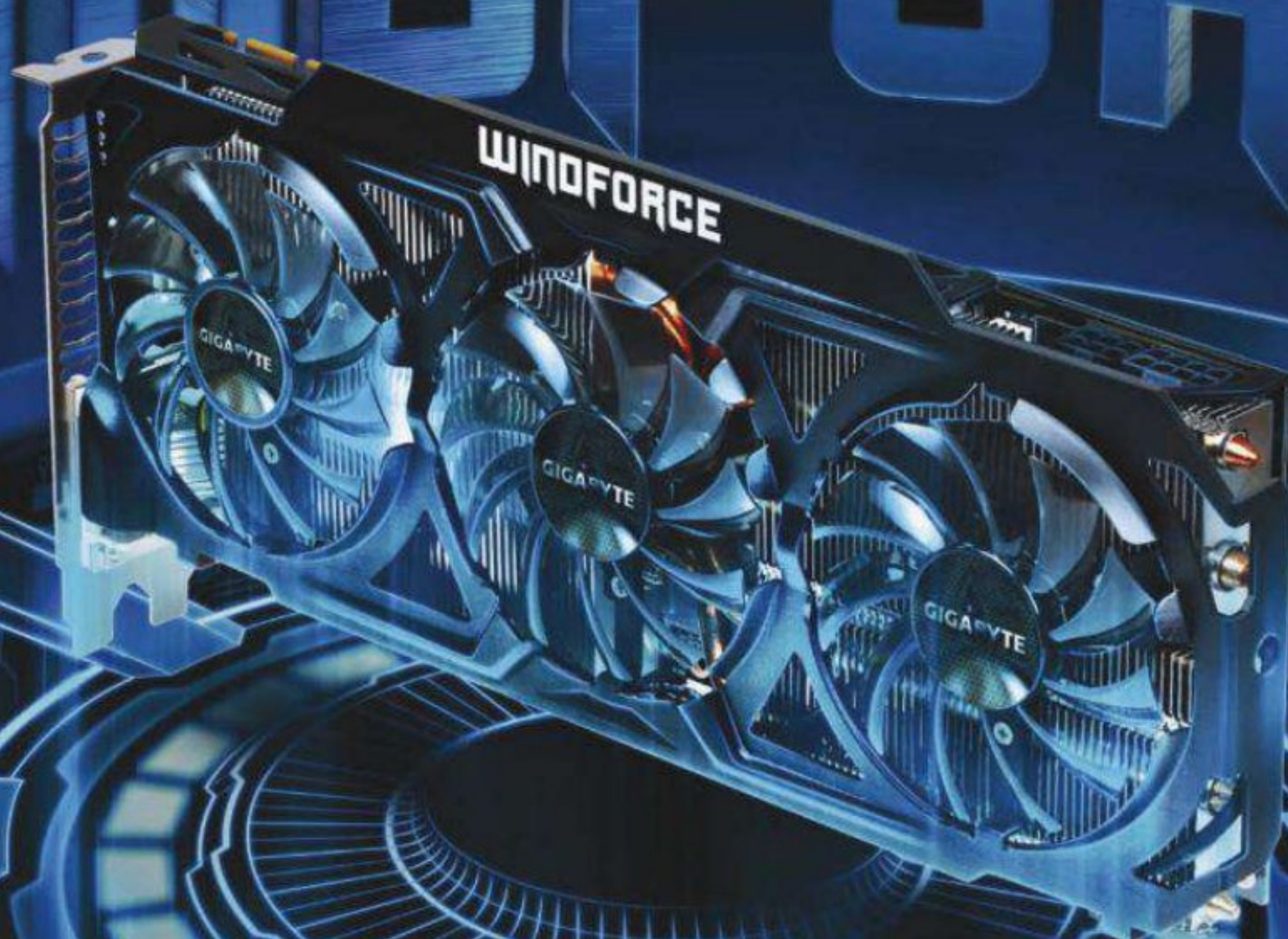
Jonathan Bray

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

OVERALL ★★★★★



GIGABYTE™

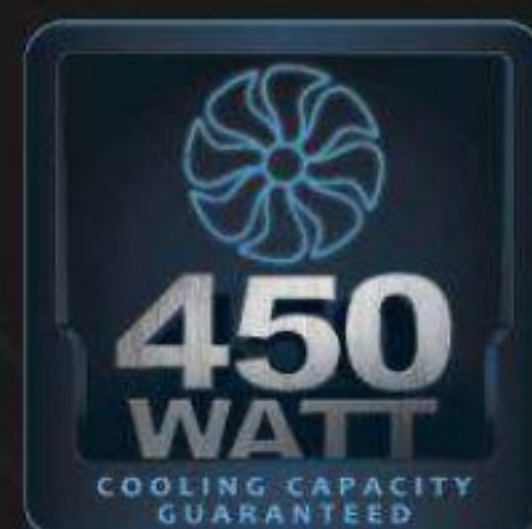


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LOGITECH G710+ MECHANICAL KEYBOARD

THE CLASSIC PERIPHERAL MAKER PLANS A TRIUMPHANT RETURN TO DESKTOPS, BUT IS THE NEW RANGE STILL COMPETITIVE?

PRICE \$189
SUPPLIER www.logitech.com.au

Back when our newly integrated sister-title Atomic used to run yearly polls of exactly what hardware was being used on the desktops of PC enthusiasts and gamers, Logitech was a dominant power, despite not really bringing out a lot of new gear in that timeframe. The features and sheer durability of its mice and keyboards, especially its G-series, lead to a loyal following.

Now, however, not only are brands like Razer dominant, but newcomers like Corsair and even GIGABYTE are producing remarkably competitive gear. In Corsair's case, it's even designed by ex-Logitech staff! So the new range of Logitech gaming gear has not only a legacy of quality to live up to, but stiffer competition than ever before.

The G710+ is the new flagship, a mechanical keyboard with an

KEY SPECS

Keyboard • palm-rest • 2x USB ports • 6x macro keys • 110-key anti-ghosting.

aggressive yet subtle gaming edge. It eschews bright colours and extraneous design elements, but still looks like something you'd be proud to own. Its body is made up of gloss plastic and matte gunmetal grey, with silver WASD and cursor keys, and a burnt orange highlight for the macro keys. It's a solid design, that looks and feels like it can take a fair bit of punishment, and is heavy enough to sit firmly on the desktop during even the most punishing of gaming sessions.

However, it doesn't *sound* solid. The keys have a hollowness to them that is not only louder than we'd like, but plain distracting. On top of that, the



mechanical action feels less... reliable than other mechanicals we've used. With such keys being more popular than ever, and peripheral makers buying batches of keys faster than they can be made, it must be assumed that some keys are going to be better than others, and that's the impression we get from the 710+. Which is odd, because after the usual breaking-in period, it really does type fine, and gaming is certainly no better or worse than our current favourite, Corsair's Vengeance K-series boards. With the ability to customise the lighting both of the entire board and the WASD keys, reliable macro functionality, and impressive solidity, it's definitely a great effort.

But, for us, still not quite the top of the line. If you're in the market for a new keyboard, and the design appeals, you won't feel sorry.

David Hollingworth

OVERALL ★★★★★☆

LOGITECH G700S

THIS HIGH-END KEYBOARD HAS A WIRELESS, RECHARGEABLE MOUSE TO MATCH – BUT IT'S BIT OF A POOR DESIGN

PRICE \$149.95
SUPPLIER www.logitech.com.au

There is a lot to like about Logitech's latest mousing effort. The G700s is comfortable (though very focused on right-handed gamers), attractive, and a pleasure to game with once you get used to the sensor placement. There are some very attractive extras, too, and wireless gaming really is hard to go away from once you get used to it.

However, there's a bit of a problem up-front which is not only awkward in execution, but just seems like an oversight in design.

The G700s features two cables and a separate tiny wireless dongle. It's the kind of device you see with dedicated portable mice, the kind meant to go with sleek notebooks. In a perfect world, it plugs into the closest USB port on your PC, and there's no hassle. However, if your PC

KEY SPECS

13x programmable buttons • up to 8200dpi tracking • up to 1000 reports/second.

is under your desk, you need to plug it into the non-charging cable supplied with the mouse. Then, when you run out of charge, you plug in the second charging cable, and game away. It's a lot of cables for a single product, and we have to wonder why Logitech didn't go for a more adaptable base-station solution, like Razer's Ouroboros, where you simply unplug the wireless station and plug that single cable into your mouse.

Even better would be Microsoft's old Sidewinder magnetic solution, but those days seem long gone now, sadly.

Thankfully the rechargeable AA battery in the G700s holds charge far longer than most competitor mice, and features like a hydrophobic coating on the upper surface make it a pleasure to use for even the most clammy-handed of folks. The location of the sensor, which is just forward of the centre of balance, takes a bit of getting used to, but the button placement, and sense of precision

from the two main buttons mean you'll be barely thinking of your mouse while gaming – you'll be too busy forgetting it's there and just getting on with it. The scroll-wheel is lovely, too, and can be set to free-spin or have a more clicky scrolling action, depending on preference. The button to switch between modes is on the top, too, so it's easy to change it to suit what you're doing.

However, for all this ease and precision, the cable/charging situation is still quite awkward. It's a shame to have such a great mouse held back by such an odd choice, but given the price premium of \$150, we really would expect this mouse to be perfect on all counts.

David Hollingworth

OVERALL ★★★★★☆





CANON EOS 100D

CANON MAKES FEW SERIOUS SACRIFICES TO DELIVER THE MOST COMPACT AND LIGHTWEIGHT DSLR YET

PRICE \$369

SUPPLIER www.canon.com.au

Having last year launched its first mirrorless-system camera – the EOS M – Canon seems determined to shrink its DSLR range, too. It's starting with the EOS 100D, which Canon claims is the smallest DSLR on the market.

Such claims sound specious when you consider that adding even the stock 18-55mm lens to the EOS 100D eliminates almost all the benefit of shaving a few extra millimetres off the body – you certainly aren't going to be slipping this into a jacket pocket. That said, Canon has made few compromises to get the 100D to this size, and it's much lighter than Canon's other new consumer DSLR, the 700D, weighing 407g compared to the 700D's 580g.

The 100D adopts the standard touchscreen of Canon's consumer DSLRs, although the 3in display on the 100D

isn't articulated. The ability to quickly adjust settings on the touchscreen compensates for the buttons that have been sacrificed to get the body down to size. There are no dedicated buttons on the downsized D-pad to adjust white balance, shooting mode or autofocus, for example: it just acts as a cursor controller. You do get a dedicated ISO button alongside the jog wheel at the top of the camera, though, and the number of options on the mode wheel has been sensibly pared back.

At first, we feared the shrunken body would make the 100D awkward to hold, but it doesn't: the rubberised front grip protrudes just far enough so you can get a firm hold on it with a forefinger resting naturally on the recessed shutter button, and there's enough space for the right thumb to rest on the grip on the rear without accidentally triggering the surrounding buttons.

The 100D shares much the same specifications as the pricier 700D. Both use Canon's DIGIC 5 processor



KEY SPECS

18MP CMOS sensor •
100-6400 ISO •
9-point autofocus
(1 cross-type) • 3in
1040kpixel display
• 1yr RTB warranty • 117
x 69 x 91mm (WDH) •
407g (body only)

and an 18-megapixel CMOS sensor. The autofocus system is different: only the 100D's central autofocus point is of the more sensitive cross-type, although in real-world use we found little difference in autofocus performance between that and the 700D, which has nine cross-type points. Only in low light did the autofocus start to wander. The 100D has a maximum burst speed of 4fps, a little slower than the 5fps of the 700D.

Picture quality is up to Canon's high standards. Images deliver plenty of detail, even with the 18-55mm kit lens, and we were particularly impressed by how the 100D handled difficult exposures with areas of bright sunlight and shade, almost always managing to deliver a balanced exposure. Even at the maximum ISO of 6400, images aren't battered by noise and can be easily rescued with a little judicious adjustment in Lightroom, making the 100D well suited to flash-free party or wedding snaps. That's just as well, because the built-in flash is weak, and the 100D doesn't have the integrated Speedlite transmitter on the 700D.

Video performance – recorded at Full HD at up to 25fps – is decent. The ability to tap the screen to focus while shooting in live view is handy, but video autofocus can be horribly slow, taking a second or two to lock onto a new subject. We're big fans of the Miniature Effect shooting mode, though, which creates a fake tilt-shift effect, then accelerates the captured footage to either 5x, 10x or 20x speed to create a time-lapse movie.

There are novelty shooting modes for stills photography, including presets for shooting fast-moving kids. There's also the option to apply creative filters after the event, replicating the Instagram-style filters generally associated with smartphone photography.

Overall, we're won over by the EOS 100D. The smaller body may have few practical benefits, but little has been sacrificed to achieve this compact shape, and the weight saving is significant. Serious photographers will probably be better off spending the extra on the 700D for the fold-out screen and slightly improved specification, but for those who just want a DSLR to pick up and go, the 100D is a tempting proposition.

Barry Collins

CANON EOS 700D

Much like the jump from the iPad 3 to the iPad 4, the upgrade from the 650D to 700D has happened by stealth, with the 650D quietly elbowed out of Canon's line-up, while the even older 600D remains. The key specifications are near-identical, but Canon has wisely chopped down the number of shooting modes on the top dial, and added the creative filters found on the 100D. The revamped stepper-motor-driven kit lens focuses silently, but remains disappointingly slow to focus in live view video. It's the pick of Canon's consumer DSLR line-up, but don't even consider an upgrade from the 650D.



PERFORMANCE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



GIGABYTE GEFORCE GTX 780 OC EDITION

FOR SERIOUS PERFORMANCE WITHOUT A TITAN-GRADE PRICE, THIS IS OUR TOP CHOICE

PRICE \$829

SUPPLIER www.gigabyte.com.au

Last month we spent some time with Nvidia's reference version of its new GeForce GTX 780 card, and we were highly impressed. What we didn't know at the time was just how this cut-down version of the ultra-expensive Titan would be priced, and just what sort of tweaks manufacturers would be able to make to Nvidia's reference design.

We now have our first production card in the Labs, the Gigabyte GeForce GTX 780 OC edition, and it is a similarly impressive unit. It eschews Nvidia's reference cooler in favour of a new generation of Gigabyte's Windforce cooler design, a metal-shrouded heatpipe-based unit that employs three fans to keep the card running smoothly. Thankfully for those with the cash and conviction to run an SLI setup, it keeps to a dual slot design, and the fans are

designed in a way that will ensure decent airflow even when abutting another card.

Performance was impressive, with the card managing to pump out a smooth 33fps at 2560 x 1600 in our demanding Crysis 3 test. In our standard Crysis benchmark, however, it managed the same framerate as the GTX 770 and 760 cards, which demonstrates that this new GPU only really shines if you are pushing the latest games at high resolutions. It is in many ways a card for the serious gamer, and while it is \$400 cheaper than a Titan, its pricetag of \$830 is going to keep it out of the hands of mere mortals.

If you just want to game at 1920 x 1080 then this card is overkill, but for those wanting to push their gaming resolution beyond that, without compromising image quality, then this is an incredibly tempting offering. It is also one that won't require upgrading for quite some time, even once the next generation of console ports begin to land. The vast majority of gamers will want



to look lower in Nvidia's lineup, but if you want the best gaming at ultra-high resolutions, then this card from Gigabyte will satisfy your needs perfectly. The cooling design is rock solid, and the performance is almost as good as the even more insanely priced Titan. Given the huge price jump between this and the Titan, and the small boost in performance that you get for your money, this is our high-end card of choice for the foreseeable future.

John Gillooly

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

GAINWARD PHANTOM GEFORCE GTX 770

SOME CLEVER FEATURES AND EXCELLENT PRICE/PERFORMANCE SET THIS CARD APART

PRICE \$490

SUPPLIER www.gainward.com

Launched just after the GeForce GTX 780, the GTX 770 is in many ways the new version of the previous flagship GeForce GTX 680. Not only does it come in at a similar pricepoint as the GTX 680, but it delivers a similar level of performance.

That means for the vast majority of gamers, this can be considered the best possible card to get. While there is no denying that the GTX 780 is a beastly performer at high resolutions, the experience delivered by the 770 is good enough, and the pricetag keeps it in the realm of reasonable.

Gainward's implementation of the GTX 770 is an excellent example of practical design. It uses a three slot cooler, which is becoming rarer as other manufacturers move to dual slot designs, but it uses this extra space in a very innovative way. The three fans are mounted underneath

the heatpipe-based cooler, pushing air out through it rather than down over the card. What really got our inner geek excited though was that each of these fans can be removed through a simple thumbscrew design, which allows for easier de-dusting of the heatsink. It is a very practical implementation, and something we can see coming in handy for dusty Australian environments.

Performance-wise, the GTX 770 sits almost exactly between the GTX 780 and GTX 760. In our Crysis 3 benchmark the card managed 27fps at 2560 x 2600 with everything cranked up. This means that, like the GTX 680, the card delivers excellent performance with settings maxed if you run at 1920 x 1080, or will require only some small compromises to get the more system intensive titles running smoothly at higher resolutions.

Given that the card is around \$350 cheaper than the GTX 780 at the moment, it is a much better option for those who are focused on 1920 x 1080 gaming. It is still costly at \$490, but it is



the best performing card on the market at that price. Add to that the fact that Gainward has put serious thought into making a practical, maintainable cooler design and this is a very impressive card.

The only thing to keep in mind is that you need enough room in your system to fit the triple height design. You won't be able to fit it into most Mini-ITX cases, for example, and if you use other PCI-E cards in your system it could possibly cause issues with placement. If you can fit it though, this is a truly excellent choice.

John Gillooly

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

GIGABYTE GEFORCE GTX 760 OC EDITION

NO PRICING YET, BUT THIS IS LOOKING LIKE A REALLY GOOD MAINSTREAM OPTION

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

This month's brand new GPU comes in the form of the GeForce GTX 760, a card designed to appeal to mainstream users, sitting below the GTX 770 in the newly revamped Nvidia lineup. It offers performance around 10-15% better than the GeForce GTX 660 Ti, and while we did not yet have retail pricing at the time of writing, we expect it to sit in the same sort of price range as the GeForce GTX 670.

Our first look at the new GPU comes in the form of this retail card from Gigabyte, which takes the standard GPU's frequency of 980MHz (1046MHz boost) and bumps it to 1085MHz (1150MHz Boost). This is paired with 2GB of GDDR5 running at an effective 6008Mhz. The GPU sports 1152 CUDA cores.

Gigabyte's design uses an updated

version of its Windforce cooler, with a plastic shroud as opposed to the metal one used on the company's GTX 770 and 780 cards. It is still a three fan design, with a heatpipe-based heatsink underneath.

As for performance, the GTX 760 managed 22fps in our Crysis 3 benchmark at 2560 x 1600. In our older Crysis benchmark we saw a very playable 67fps at very high detail. As we suspected, the GPU isn't really capable of pumping out playable framerates at ultra-high resolutions, but for those still gaming at 1920 x 1080 its performance is ample. While those wanting to keep all their settings cranked at that resolution will want to look to the GTX 770, for those happy to make a few compromises in the most demanding games, this is a great mix of price and performance.

We don't yet have street pricing for the card, but the targeted US MSRP is \$299, which should translate to



somewhere between \$350 and \$400 in Australian money. This makes it a much more reasonably priced product than the other members of the GeForce GTX 700 series.

As long as the price is right, then this is a very tempting card, outperforming AMD's RADEON 7950 and nipping at the heels of the RADEON 7970.

John Gillooly

PERFORMANCE	★★★★★
FEATURES&DESIGN	★★★★★
VALUE FOR MONEY	N/A
OVERALL	★★★★★

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LABS BRIEFS

► RAZER ATROX

PRICE \$255

WEBSITE www.razerzone.com/au



Even if you're not into console-based fighting games, you've got to admire the sheer engineering and thought put into Razer's latest game controller. Up, up, down, forward, jump could be meaningless ranting – it kind of is to us, too – but the Atrax is a thing of rare beauty.

It's designed with the true enthusiast fighting fan in mind. It accurately mirrors the stick and button layouts of the arcade cabinets of yore, the controls that all modern fighting games are built around. It's solid, with a wonderfully grippy rubber base and heavy enough to be able to take some gaming punishment. It's responsive, too, and you just feel like a better fighter using it.

What's more impressive, though, is that it's made with the modding community in mind. You can flip the entire top panel to get access to all the internals, as well as an alternate stick and multi-tool. The lid is even hinged hydraulically. This is a controller you'll treasure.

David Hollingworth



OVERALL



► TP-LINK TD-W8980

PRICE \$110

WEBSITE www.tplink.com.au

TP-Link's latest modem/router combo is an elegantly-styled, matte and gloss black unit sporting three wireless antennae. It's light, and will look alright stuck in your study or somewhere in the living room.

Its real selling point isn't design, however, but rather convenience. It offers a dual-band solution to adding Wi-Fi to your network, allowing high-bandwidth tasks like media-streaming and gaming to its 5GHz band, while less intensive tasks can use the lower 2.4GHz band without interrupting more intensive tasks.

It features two USB ports for adding devices like network storage and printers, and even features an actual off-switch for easy resetting – something oddly missing on a surprisingly large number of routers! With built-in parental controls it's perfect for any mixed household (and annoying flatmates), and is remarkably easy to get set up and running with a minimum of fuss. Once working, we had no issue connecting a range of devices throughout our handy test residence.

David Hollingworth



OVERALL



► ASUS ROG MAXIMUS VI GENE

PRICE \$275

WEBSITE www.asus.com.au

We were incredibly impressed last month with ASUS' Micro ATX Gryphon board, and this time around we have the Micro ATX model from the ROG lineup of products.

The Maximus Gene VI is a well-rounded gaming board, despite its small size. It has dual PCI-E x16 slots for those who want to run SLI, suitable for dual height graphics cards. Also onboard are eight SATA 6Gbps ports, four DIMM slots and x4 PCI-E slot. In keeping with its gamer focus audio is supplied by Asus Supreme FX setup, which combines a Realtek codec and shielded audio circuitry. It isn't as impressive as the SoundBlaster codecs used on some other products, but it delivers respectable quality audio. One of the more interesting additions is a riser card that supports mini PCI-Express 2.0 and the new M.2 SSD connector. This is smaller than the mSATA format, and while drives are still rare, it is an interesting addition for caching or even a boot drive solution. Yet again this is a great all-rounder, even if we do expect competing Micro-ATX gaming boards to be cheaper options.

John Gillooly



OVERALL



► ASUS GEFORCE GTX 780 DCU II

PRICE TBA

WEBSITE www.asus.com

One of the major criticisms levelled at the last generation of DCU II graphics cards was that ASUS insisted on going with a three slot design, even if its own motherboards wouldn't fit them in SLI. With the new generation of DCU II cooler ASUS has reduced the thickness, and it is now only a dual slot option. The card retains the same great performance that we have come to expect from this lineup of product, and the new heatsink is an impressive cooler. The GTX 780 does, oddly, stick with a design curio that marred the previous generation, where the shroud looks like it doesn't actually fit the heatsink, instead being offset a few centimetres and overhanging the rear of the PCB. This is a minor cosmetic thing though, and doesn't affect the card's performance. We just wonder why they persist in doing this. With performance targeted at those who want the most from ultra-high res, this isn't a card for everyone, but a great GTX 780 solution nonetheless.

John Gillooly



OVERALL



► SEAGATE CENTRAL

PRICE \$350

WEBSITE www.seagate.com.au

It's a growing truth that any modern house will almost always be short of one of the great resources of our time – easy-to-access storage! But that's exactly the challenge that Seagate's answering with its new Central range.

We spent some time with the massive 4TB model, and it's a very handy device for any media-saturated home or office. Sitting on four sturdy rubber feet, its low profile is unobtrusive but still attractive, with a mostly mesh shell to keep the unit running cool.

But it offers more than just immense space for whatever digital craft you want to hold on to. This connected storage device lets you set up backups from multiple devices to one location, and with a free app you can even browse all your data from anywhere on the road. You can also log on from any web browser to share music, movies, or just your favourite family recipe.

Setup is simple, requiring you to just plug it in, let the drives settle in, and then visit the Seagate site where you're walked through the rest of the process step-by-step. Then you're prompted to update the device's firmware, and you're ready to go. There are apps for both iOS and Android, so it's pretty agnostic.

A handy way to keep your files safe.

David Hollingworth



OVERALL



► GIGABYTE GEFORCE GTX 770 OC

PRICE \$530

WEBSITE www.gigabyte.com

As we discovered in our Gainward GeForce GTX 770 review this month, this is the GPU that the vast majority of people will want to use. It delivers decent performance at 2560 x 1440 resolution and more than enough performance for those wanting to game at 1920 x 1080.

Given that the GTX 770 is where the hottest competition is occurring, this is the segment where price sensitivity is greatest. While Gigabyte's card is its OC model with the same metal shrouded heatsink design as its GTX 780, it does come with a noticeable price jump over the Gainward GTX 770 card. There is a tiny performance increase with this card, but it isn't enough to justify the \$40 price difference, and ultimately that holds the Gigabyte card back from being our model of choice. This is still an excellent solution, but we suggest that those hankering after this level of performance will find that the cheaper models on the market will end up being just as suitable for their needs.

John Gillyooly



OVERALL



► THERMALTAKE MASSIVE 14X NOTEBOOK COOLER

PRICE \$20

WEBSITE www.thermaltake.com

As laptops continue to become thinner and lighter, we are hitting a point where thermal management is becoming something to give careful consideration to. Especially if you are wanting to replace your desktop with a laptop, you'll want to augment your cooling on a lot of designs. Not only is there the benefit of your laptop running cooler and not dropping in performance due to thermal throttling, but we are noticing more and more that some internal laptop coolers struggle to keep up with heavy workloads. By augmenting the cooling with a product like the Massive 14x, you can reduce the fan noise being output by struggling thermal systems. While it sounds frivolous, we can attest that after a few days of listening to a product like Toshiba's Kirabook howl that your sanity is well worth the cost of a laptop cooler.

For a mere \$20 and the use of a USB port, this lightweight plastic design can make a huge impact on temperature and noise, and for that reason alone we love this product.

John Gillyooly



OVERALL



► LOGITECH ULTRATHIN KEYBOARD MINI

PRICE \$80

WEBSITE www.logitech.com.au

If you don't own an iPad Mini, an iPad Mini keyboard is probably the last thing you could be interested in. But, as a fellow Mini non-owner, this excellent Bluetooth-powered keyboard is making us really, really want to get one.

Logitech's no stranger to Apple keyboards, and its iPad version has been turning heads (and hands) since it was released. This Mini version is just as handy. It features an anodised outer shell that matched the sheen of your Mini, and doubles as both keyboard and magnetic cover.

More clever still is the keyboard itself. It's a little cramped, obviously, but still much better to type on than the onscreen version, and has some great features, like both forward and backspace keys, and very handy Function keys on the cursors, allowing you to select entire blocks of text with just a few key presses. If you do any amount of writing on your Mini, this is practically an essential purchase.

David Hollingworth



OVERALL



SMARTPHONE SUPERTEST

IT'S A BATTLE OF HEAVYWEIGHTS THIS MONTH AS THE WORLD'S BEST SMARTPHONES GO HEAD TO HEAD. WE'VE PICKED 13 OF THE LATEST HANDSETS, PUTTING THEM THROUGH TOUGH TESTS TO FIND OUT IF ANYONE CAN TOPPLE SAMSUNG AT THE TOP OF THE SMARTPHONE TREE, AND WHICH ARE BEST FOR THOSE ON A BUDGET



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Buyer's guide

Mobile technology has been on an upwards trajectory over the past few years. Nowadays, it seems every phone is smart, and with so many available it's increasingly tough to make the right choice. It's why, for many people, it seems to come down to a decision between one or two major handsets.

In reality, there's much more choice than that, and many phones make convincing cases for your cash. So what features should you be looking out for? What separates the best from the simply good in this month's roundup?

HARDWARE

In many respects, the smartphone arms race mirrors that contested by laptop and PC manufacturers over the years, with every new generation bringing faster performance than the one before.

Do you need it? As phone OSes, apps and games become ever more sophisticated, the answer to this question must be yes.

Buying the fastest smartphone you can afford guarantees that, in a year or two, your phone won't be on its last legs. This is especially important for Android phones: apps and games become more demanding by the day, and OS updates have the potential to slow older phones to a grinding crawl.

Other operating systems are less susceptible to the gradual creep of software demands, but as iPhone owners will attest, Android owners aren't the only ones who suffer performance degradation over time.

At the moment, the fastest processors are found in Android smartphones: ARM-based, quad-core monsters, sported by the Samsung Galaxy S4, the HTC One and the Sony Xperia Z. These ensure the latest 3D games play without stuttering and that the handset runs smoothly while multitasking. There's nothing more frustrating than having your record Temple Run score ruined because your phone paused to download a batch of emails.

BlackBerry and Windows Phone 8 handsets may not look as quick on paper - or in benchmarks - but don't discount them on clock speed and core count alone. Their OSes are more efficient than Android, and can run

smoothly with less power.

HARD CORE

Aside from pure power, the design and toughness of the screen is a key differentiator. Gorilla Glass, a super-tough, scratch- and shatter-resistant glass used on flagship phones, is well worth having, especially if you're clumsy.

Increasingly, manufacturers are also building splash resistance and even full waterproofing into their phones. Spill a beer over the Sony Xperia Z and it's far more likely to survive than the HTC One or Samsung Galaxy S4.

The quality of the screen on a smartphone remains paramount, but even here manufacturers are finding ways to set their products apart. The brighter the screen the better, since this makes reading in sunlight more comfortable, but it's also worth keeping an eye out for a screen laminated to the LCD panel beneath - the lack of space between the two panels helps keep reflections to a minimum.

"Super-sensitive" touchscreens are also becoming increasingly common - all the latest Nokia Lumia phones, as well as the Samsung Galaxy S4, have this feature, which allows you to use your phone on a cold day without having to take off your gloves.



▲ The Sony Xperia Z can survive being submerged in water

YOUR FLEXIBLE FRIEND

Don't underestimate the value of having a microSD slot to expand the storage of your phone, either. Games and movies can occupy a huge amount of storage space - several gigabytes each, in many cases - and you may find yourself stretching the boundaries of your 16GB or 32GB allocation sooner than you think.

A user-replaceable battery is just as handy. Apple, HTC and Sony seal the batteries inside most of their phones, so if there are problems you have to send the handset away for repair. A phone with a replaceable battery, however, means you can fix

- 1 A removable rear panel gives access to the interior. In the case of the Samsung Galaxy S4, this means you can add more storage and swap out the battery
- 2 Look out for tough Gorilla Glass displays - they're more scratch- and shatter-resistant than ordinary glass





▲ Consider the quality of apps available on each platform

a problem yourself - usually cheaply - in days rather than weeks.

There are other benefits. Keeping a spare battery in your bag will ensure you can keep going even when you can't get to a socket. With more popular phones, you can often boost battery by replacing the standard power pack with a higher-capacity one. Backup battery chargers are becoming more and more common nowadays, so this isn't as much of an issue as it used to be.

NFC, on the other hand, has yet to come of age, despite its inclusion in many of this month's handsets. Until contactless payment via mobile phone becomes more widespread, it will remain little more than a gimmick used to make Bluetooth pairing more easy, and little more.

SOFTWARE AND ECOSYSTEM

What of software? This is trickier. Assuming you're a smartphone owner already, chances are you'll have a library of essential apps you've bought or downloaded over the years. This makes moving from iOS to Android - or perhaps back the other way - rather daunting.

Is it worth moving? This is a question we can't answer for you:

you'll have to decide which apps you can't live without, and how much you're willing to fork out. Check out the various app stores online - they all have their own websites - to find out how much it might cost and whether the apps you need are available before you make your final decision.

It may be advisable to think long term, though. Although the Apple App Store used to be best in terms of the quality and breadth of its apps, Android has now caught up, and all the major online services, from Spotify to Facebook, now develop for both platforms side by side. Moving to Android means you'll also have more choice over handsets in future.

If you're tempted by Windows Phone 8 or BlackBerry 10 OS, however, you'll have to put up with a comparative lack of riches. This may change, but both have yet to reach critical mass.

Finally, a word on ecosystems. It's worth bearing in mind that the more popular a model of phone is, the broader the range of accessories will be. The iPhone may not be top dog for hardware any more, but it's still the phone to go for if you want the best choice of cases, battery boosters, camera adapters and docks.

HOW WE TEST

BATTERY LIFE

We've run our standard 24-hour battery rundown test on every phone in this month's Labs. In this test, we download an example podcast, play it through headphones on loop for an hour, display a white screen for an hour, and make a 30-minute phone call. We then leave the phone synchronising a single Gmail account using the phone's default method until 24 hours is up. All battery life tests are run with the screen at half brightness and cellular communications on, but all other wireless radios disabled.

PERFORMANCE

We've given the hardware inside these phones a strenuous going over. The browser-based SunSpider JavaScript and Peacekeeper HTML 5 tests are used to give a true cross-platform view, and we've also used a selection of other CPU and graphics benchmarks to show how the phones deal with more strenuous workloads. For Android, iOS and BlackBerry 10 OS we use Geekbench, which measures processor and memory performance, and on Android we also run Quadrant, which has 3D graphics elements.

HANDS-ON TESTING

These benchmark results are combined with our subjective appreciation of the general responsiveness and smoothness of each phone, both in its operating system and when running apps and demanding games. We also explore the software on each phone, taking particular care to test the various proprietary applications and additions made by each manufacturer to its handsets.

Image quality from the built-in camera also contributes to the final performance scores, as does screen quality and contrast. We measure all of our screens using a colorimeter, noting maximum brightness and contrast.

VALUE FOR MONEY

Finally, for the Value for Money score, we take into account the SIM-free pricing at the time of writing. We combine this with the other ratings to give a score out of six.



► We measure all of the phones' screens using a colorimeter

▼ The logos below show which OS runs on each phone




LABS WINNER

	Apple iPhone 5	BlackBerry Q10	BlackBerry Z10	HTC One	HTC Windows Phone 8X	Huawei Ascend W1	
Overall	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	
Performance	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★★	★★★★☆	
Battery Life	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	
Features & Design	★★★★☆	★★★★☆	★★★★☆	★★★★★	★★★★☆	★★★★☆	
Value for Money	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	
Pricing & contracts							
Outright price	16GB, \$799; 32GB, \$899; 64GB, \$999	\$730	\$580	32GB, \$800	\$330	\$230	
Supplier	www.apple.com/au	au.blackberry.com	au.blackberry.com	www.htc.com/au	www.htc.com/au	www.huawei.com/au	
Warranty	1yr RTB	1yr RTB	1yr RTB	1yr RTB	1yr RTB	1yr RTB	
Display							
Screen size (diagonal)	4in	3.1in	4.2in	4.7in	4.3in	4in	
Screen resolution	640 x 1136	720 x 720	768 x 1280	1080 x 1920	720 x 1280	480 x 800	
PPI	326	328	355	468	342	233	
Panel technology	IPS	Super AMOLED	IPS	S-LCD	S-LCD	IPS	
Core specifications							
Processor	1.2GHz dual-core Apple A6	1.5GHz dual-core TI OMAP 4470	1.5GHz dual-core Snapdragon S4 Plus MSM8960	1.7GHz quad-core Snapdragon 600	1.5GHz dual-core Snapdragon S4 Plus MSM8960	1.2GHz dual-core Snapdragon S4 Plus MSM8230	
RAM	1GB	2GB	2GB	2GB	1GB	512MB	
Internal storage capacity	16/32/64GB	16GB	16GB	32/64GB	16GB	4GB	
Memory expansion	✗	✓	✓	✗	✗	✓	
NFC	✗	✓	✓	✓	✓	✗	
4G	✓	✓	✓	✓	✓	✗	
Camera							
Resolution	8MP	8MP	8MP	4MP	8MP	5MP	
Focus type	Autofocus	Autofocus	Autofocus	Autofocus	Autofocus	Autofocus	
Built-in flash type	LED	LED	LED	LED	LED	LED	
Front-facing camera	✓	✓	✓	✓	✓	✓	
Video recording	1080p	1080p	1080p	1080p	1080p	720p	
Wireless connectivity							
Bluetooth	4	4	4	4	3.1	2.1	
Wi-Fi	dual-band 802.11n	dual-band 802.11n	dual-band 802.11n	dual-band 802.11ac	dual-band 802.11n	single-band 802.11n	
GPS	✓	✓	✓	✓	✓	✓	
Power							
Battery capacity	1440mAh	2100mAh	1800mAh	2300mAh	1800mAh	1950mAh	
Talk time, quoted (max)	8hrs	10hrs	10hrs	Not stated	Not stated	10hrs 30mins	
Standby, quoted (max)	9 days, 9 hours	13 days	16 days, 6 hours	Not stated	Not stated	19 days, 12 hours	
Software							
Operating system	iOS 6	BlackBerry 10 OS	BlackBerry 10 OS	Android 4.1.2	Windows Phone 8	Windows Phone 8	
Physical							
Accessories	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset	
Dimensions (WDH)	58.6 x 7.6 x 123.8mm	67 x 10.4 x 120mm	65 x 9.1 x 130mm	68 x 9.3 x 137mm	66 x 10.1 x 132mm	64 x 10.5 x 124mm	
Weight	112g	139g	137g	143g	130g	130g	
Slots/ports	Lightning	micro-USB, micro-HDMI	micro-USB, micro-HDMI	micro-USB	micro-USB	micro-USB	
Benchmarks							
Peacekeeper	905	402	365	673	340	280	
Quadrant	N/A	N/A	N/A	11,617	N/A	N/A	
Geekbench	1,674	1,700	1,779	2,733	N/A	N/A	



	Nexus 4	BEST VALUE Nokia Lumia 520	RECOMMENDED Nokia Lumia 720	Nokia Lumia 920	RECOMMENDED Samsung Galaxy S4	Sony Xperia SP	Sony Xperia Z
	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
	8GB, \$349; 16GB, \$399	\$180	\$300	\$450	16GB, \$899	\$400	\$600
	http://play.google.com	www.nokia.com.au	www.nokia.com.au	www.nokia.com.au	www.samsung.com.au	www.sony.com.au	www.sony.com.au
	1yr RTB	1yr RTB	1yr RTB	1yr RTB	1yr RTB	1yr RTB	1yr RTB
	4.7in	4in	4.3in	4.5in	5in	4.6in	5in
	768 x 1280	480 x 800	480 x 800	768 x 1280	1080 x 1920	720 x 1280	1080 x 1920
	316	233	217	332	441	319	441
	IPS	IPS	IPS	IPS	Super AMOLED	TFT	IPS
	1.5GHz quad-core Snapdragon S4 Pro APQ8064	1GHz dual-core Snapdragon S4 Plus MSM8227	1GHz dual-core Snapdragon S4 Plus MSM8227	1.5GHz dual-core Snapdragon S4 Plus MSM8960	1.9GHz quad-core Snapdragon 600	1.7GHz dual-core Snapdragon S4 Pro MSM8960T	1.5GHz quad-core Snapdragon S4 Pro APQ8064
	2GB	512MB	512MB	1GB	2GB	1GB	2GB
	8/16GB	8GB	8GB	32GB	16/32/64GB	8GB	16GB
	✗	✓	✓	✗	✓	✓	✓
	✓	✗	✓	✓	✓	✓	✓
	✗	✗	✗	✓	✓	✓	✓
	8MP	5MP	6.1MP	8.7MP	13MP	8MP	13MP
	Autofocus	Autofocus	Autofocus	Autofocus	Autofocus	Autofocus	Autofocus
	LED	N/A	LED	dual-LED	LED	LED	LED
	✓	✗	✓	✓	✓	✓	✓
	1080p	720p	720p	1080p	1080p	1080p	1080p
	4	3	3	3.1	4	4	4
	dual-band 802.11n	dual-band 802.11n	dual-band 802.11n	dual-band 802.11n	dual-band 802.11ac	dual-band 802.11n	dual-band 802.11n
	✓	✓	✓	✓	✓	✓	✓
	2100mAh	1430mAh	2000mAh	2000mAh	2600mAh	2370mAh	2330mAh
	15hrs	14hrs 40mins	13hrs	18hrs 36mins	17hrs	19hrs	14hrs
	15 days	Not stated	21 days	19 days, 4 hours	14 days	30 days	23 days
	Android 4.2	Windows Phone 8	Windows Phone 8	Windows Phone 8	Android 4.2.2	Android 4.1	Android 4.1.2
	Charger	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset	Charger, stereo headset
	68 x 9.1 x 134mm	64 x 9.9 x 120mm	67 x 9 x 128mm	71 x 10.7 x 130mm	69 x 7.9 x 136mm	67 x 10 x 130mm	71 x 7.9 x 124mm
	139g	124g	128g	185g	130g	155g	146g
	micro-USB	micro-USB	micro-USB	micro-USB	micro-USB	micro-USB	micro-USB, micro-HDMI
	402	223	221	333	588	390	385
	4,993	N/A	N/A	N/A	12,730	7,644	7,744
	2,082	N/A	N/A	N/A	3,221	2,003	1,911



HTC ONE



STUNNING DESIGN, PLENTY OF ADVANCED FEATURES AND FLAWLESS PERFORMANCE MAKE THE HTC ONE OUR FAVOURITE HIGH-END HANDSET

PRICE \$800
SUPPLIER www.htc.com/au

After an initial period where HTC seemed destined to be the flagship maker of Android smartphones, thanks to stellar products like the Desire, it has faltered in the face of the rising might of Samsung. In many ways it didn't help its fortunes with a myriad confusing product names and minor variations on the same theme. Even though it has delivered some great handsets in this intervening period, it hasn't managed to recapture the magic of the Desire until now.

When HTC chose to follow Samsung and shun the mobile industry's annual show, Mobile World Congress, earlier this year, we thought it might have delusions of grandeur. However, it allowed us to absorb its technical advances and learn to love the HTC One before the avalanche of new handsets swamped the market.

The thing is, despite that flurry of new phones – and the arrival of the Samsung Galaxy S4 – we still love the One. Why? It's a combination

of factors, starting with its physical design and appearance. The One is the best-looking phone on the market. Its curved, silver aluminium rear panel looks and feels gorgeous, its CNC-machined edges catch the light and glimmer attractively, and the polycarbonate inlays on the rear and around the edges provide the perfect contrast. It's 13g heavier than the Samsung Galaxy S4, and 1.4mm thicker, but we'd take that hit for the sheer beauty of the design.

DISPLAY AND PERFORMANCE

When you switch it on, the quality of the display maintains the high-class feel. It's a stunning Full HD panel, and although it doesn't match the S4 for sheer size, at 4.7in across, we've no problem at all with its quality.

Its top brightness, 481cd/m2, is considerably higher than the S4's figure of 221cd/m2, so it's easier to read in bright sunlight, and contrast levels are fine. If anything, the colours are slightly less intense than on the S4, but the difference is marginal.

Furthermore, despite an apparent

disadvantage on the speed front, the One is the slicker and more responsive phone. Its 1.7GHz Snapdragon 600 is clocked 200MHz slower than the Samsung's, and results in the benchmarks reflect this. It completed the SunSpider test in 1154ms, compared to the S4's 1148ms, and scored 11,617 in Quadrant, behind the Samsung's huge 12,730.

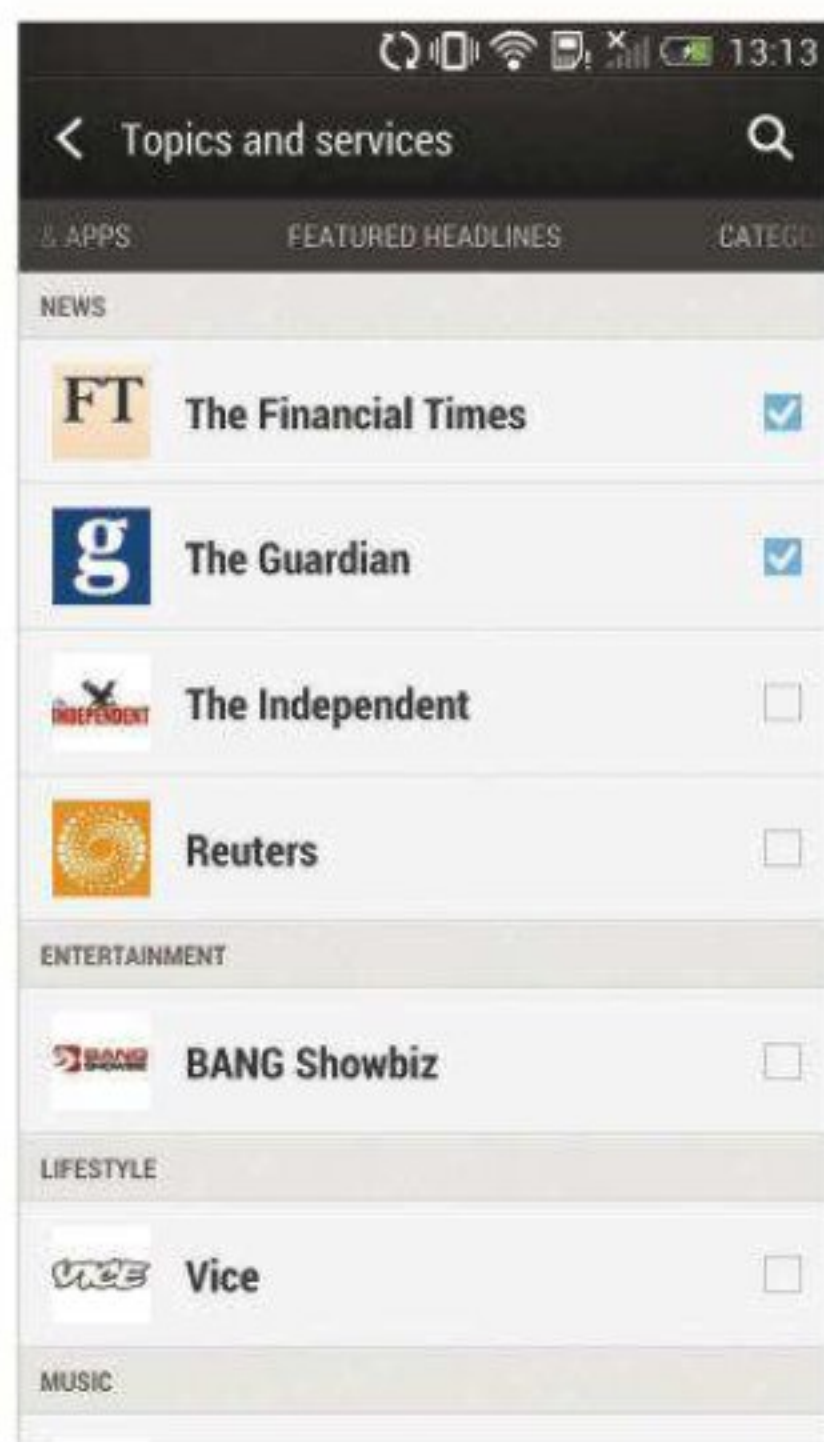
Yet, while navigating around the OS, we experienced none of the annoying pauses that afflicted the S4. Apps launched in double-quick time, as did web pages. It's the most responsive Android smartphone we've used, and there's no game you can throw at it that will make it pause for breath.

SENSE-IBLE SOFTWARE

We also prefer the One's UI. The revamped, pared-back Sense Android overlay is far easier to get to grips with than Samsung's TouchWiz, and although it doesn't boast the same richness of features, Sense 5 does all the essentials well.

We're still not entirely convinced by BlinkFeed – the HTC One's default homescreen. It presents a list of

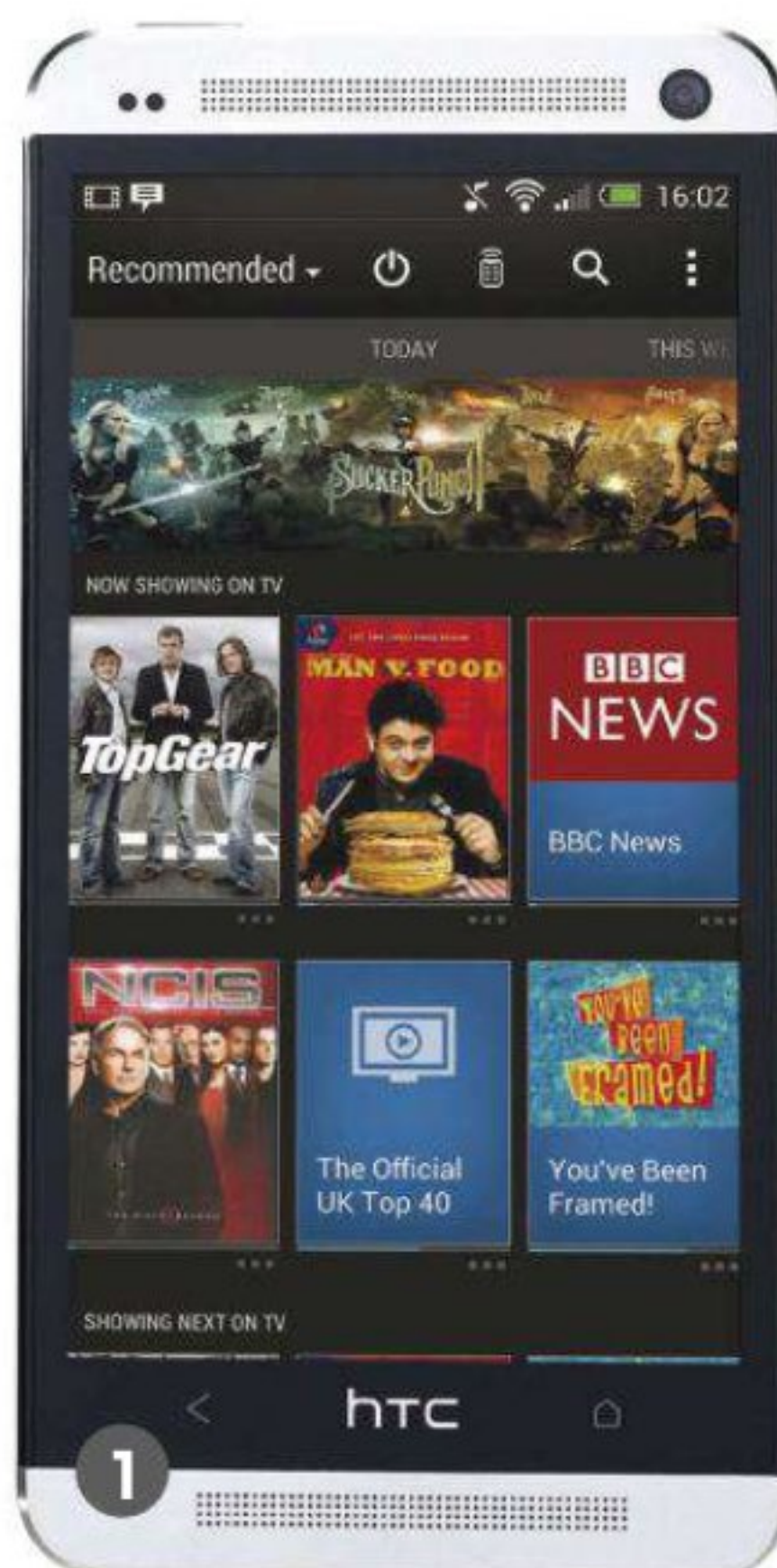
- 1 Audio output from the stereo speakers is very loud
- 2 The 4-megapixel camera performs well in low light
- 3 The HTC One isn't ultra-slim, but it looks gorgeous



▲ The BlinkFeed homescreen stream can be tailored to your own needs



▲ The HTC TV app shows what's on and allows you to change channel courtesy of the phone's IR emitter



vertically scrolling tiles, combining both news headlines and social-media updates in one stream of constantly updating information. In particular, we're less than enamoured with its decision to make the feed impossible to remove (although you can move it off the main homescreen). However, it's certainly more appealing than the S4's mess of widgets and proprietary apps.

CAMERA

HTC took a risk when it decided to include a 4-megapixel sensor in the One, since so many others are pushing up to 13 megapixels; the surprise is that its camera is just as good as the S4's. Pictures snapped with the S4 are more detailed in good light, but the One's larger "UltraPixels" and optical stabilisation give it the advantage in murky conditions, producing less noisy photos.

The One also produces balanced exposures more reliably than the S4 in a range of different conditions, although its autofocus is slower, and its macro mode isn't as good.

Elsewhere, nothing is spared: the HTC is equipped with 4G, Bluetooth, NFC and dual-band 802.11ac Wi-Fi. Just like the S4, it has an infrared transmitter that allows you to control your TV, either through the bundled HTC TV app or via third-party software downloaded from Google Play. The free Dijit app does the job nicely.

SOUNDS GREAT

One area where the HTC One comprehensively outperforms its rival is speaker quality. The audio output from the drivers above and below the Full HD display is astonishing in both its clarity and volume – be careful, though, or you may give yourself a heart attack the first time you use the alarm clock to wake up. Call quality is second to none, too.

With outright pricing leaning heavily in favour of the HTC One, there was only one smartphone we could hand our overall award to this month. Its gorgeous design, coupled with an elegant front-end, performance fast enough for any purpose, and responsiveness that outdoes even the Samsung Galaxy S4, means our Labs winner has to be the HTC One, a deserving recipient of the title of best Smartphone of 2013.



BATTERY LEFT AFTER 24HR TEST



PERFORMANCE
BATTERY LIFE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



SAMSUNG GALAXY S4



A SUPERB SMARTPHONE THAT EXCELS IN MOST AREAS, BUT IT'S LET DOWN BY SOFTWARE GLITCHES, AND A MAIN RIVAL THAT'S A LITTLE BIT BETTER IN MOST AREAS



PRICE \$899
SUPPLIER www.samsung.com.au

It seems that Apple has dominated the smartphone scene forever, but for once the most anticipated smartphone launch of 2013 wasn't an iPhone – it was the Samsung Galaxy S4. Following on from the Galaxy S III, we were expecting great things, yet when the handset eventually showed up we were underwhelmed. The S4 is a fabulous handset, but it isn't as good as all the hype might have you believe.

Let's start with what it does well. It's thinner and lighter than both the Galaxy S III and its current main rival the HTC One, despite having a larger screen.

The camera is excellent, and has a significantly higher resolution than HTC's flagship model. At 13 megapixels, images shot in good light look crisp, and the macro mode is superb. In low light, it loses out to the HTC One, whose lower resolution and optical image stabilisation produce less noisy snaps.



We do like the practicality of the S4, though. Unlike the HTC One and other top-end handsets, the battery is replaceable, and a microSD card can be added to increase the storage allocation by up to 64GB.

WEAKNESSES

Where it can't match the opposition is in terms of all-round display quality. Although we have no quibble with the colours – which are as eye-popping and luxuriant as you'd expect of a Super AMOLED unit – or the sharpness,



▲ Air View lets you hover your finger over the screen for a quick preview much like Cinemagram on the iPhone



▲ Wave a hand in front of the S4 and you can flick between photos in the gallery app



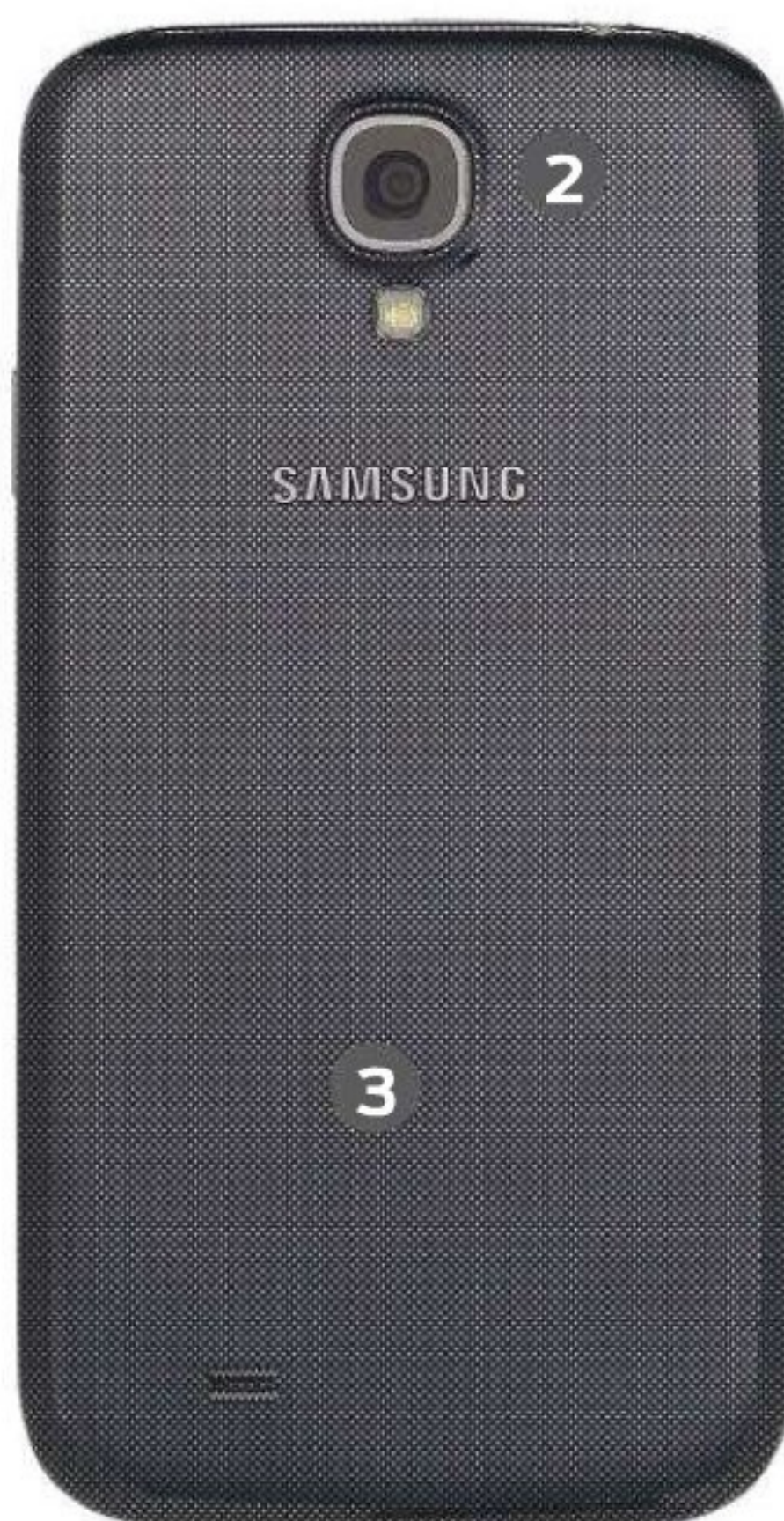
▲ The S4 has an infrared transmitter, allowing you to use it as a universal remote app



▲ The S4's camera is stuffed with gimmicks, including Dual Shot, which captures stills and video from front and rear cameras simultaneously



▲ The S4's Animated Photo features allows you to capture stills with moving parts – much like Cinemagram on the iPhone



- 1 The Super AMOLED display has a pixel density of 441ppi
- 2 The 13-megapixel camera is excellent, producing crisp shots
- 3 The S4's speaker isn't a patch on the HTC One's stereo pair

advantage over the One. The 1.9GHz quad-core Snapdragon 600 processor and 2GB of RAM helped it finish the SunSpider test in 1148ms, compared to the HTC's 1154ms result, and it comfortably trounced its rival in other benchmarks as well, scoring 12,730 and 3221 in Quadrant and Geekbench respectively. If all-action games are your thing, you won't be disappointed. Every title we played was smooth and hesitation-free.

Finally, battery life is unremarkable. Despite a huge 2600mAh battery, the S4 had 60% remaining on the gauge after our 24-hour test, which is no better than average.

It's certainly the most powerful handset around, then, but with the Samsung Galaxy S4 coming in at a significantly higher price than the HTC One, it is tough to justify handing it top honours this time.

The Samsung Galaxy S4 is still good enough for a recommendation, but the HTC One is the better all-rounder in this year's lineup of high end smartphones..

the maximum brightness disappoints. We measured it at 221cd/m2, a long way behind the HTC's 481cd/m2, and less bright than even the Samsung Galaxy S III, the phone it replaces at the top of Samsung's range. Indoors, this isn't an issue, but it's less readable in extremely bright light.

The plastic-chassis design can't compare with the crafted, quality feel of the HTC One, or the one-piece polycarbonate designs from Nokia, and it isn't waterproof like the Sony Xperia Z. The Gorilla Glass screen should resist scratching, however.

The extra "Smart" features feel grafted on and unnecessary. You can waft your hand in front of the screen to move between emails and photos, hover a finger over emails to view a

quick preview, or scroll up and down web pages by tilting the phone, but we guarantee these features will have lost their appeal within a month or two.

We prefer HTC's Sense to Samsung's TouchWiz UI. TouchWiz is powerful, and has a particularly well-endowed camera app that is stuffed with features, but it feels cluttered and complicated. Most disappointingly, it's afflicted with far more pauses, hesitations and freezes than we'd expect on a cutting-edge phone. It's clearly in desperate need of a software update.

SPEED DEMON

Benchmark performance is the only area where the S4 holds a clear-cut

BATTERY LEFT AFTER 24HR TEST



PERFORMANCE
BATTERY LIFE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL





- 1 The AMOLED display is colourful but not very bright
- 2 Under the panel is a removable battery
- 3 The Q10 is solid, but not the slimmest phone around

BLACKBERRY Q10



A FANTASTIC KEYBOARD AND BLACKBERRY 10 OS MAKE THIS A GREAT PHONE FOR MESSAGING, BUT IT ISN'T UP TO SCRATCH IN MOST OTHER AREAS

PRICE \$730
SUPPLIER www.blackberry.com/au

BlackBerry made its big comeback earlier this year with the Z10, but decided to hold fire on its keyboard-based Q10 until recently. Given the company is famed for its keyboard-based phones, it was an odd decision, to say the least.

It's here now though, and physically, it's every inch the classic BlackBerry. We like the soft, rubbery rear panel which feels grippy, and there's practicality in spades. The Q10's rear panel is removable, revealing a replaceable 2100mAh battery and a microSDXC slot. Next to the micro-USB socket on the left, there's a micro-HDMI output, for piping movies to your TV at up to 1080p and, of course, there's the hardware keyboard.

The good news is that it's superb. In typical BlackBerry fashion each key is shaped slightly, with the inward-facing upper corners raised. This makes them easier to locate with the thumbs,

and the strip between each of the four rows helps to avoid mispresses. The click of each key is soft yet firm, leaving you in no doubt as to whether you've pressed one, and there are no annoying lips or ridges to cramp your style. This is BlackBerry at its best.

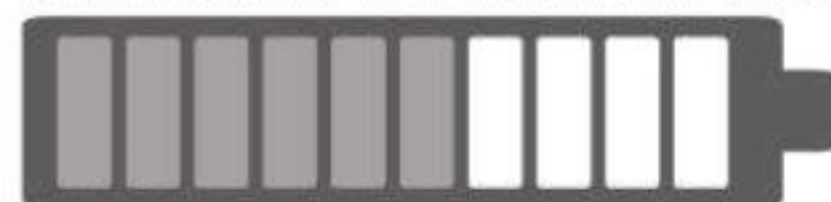
The Q10's screen isn't as good. The Super AMOLED panel delivers bright, deeply saturated colours, but it simply isn't as readable as the Z10's is in full sunlight. We measured it at a top brightness of 267cd/m2, compared to the Z10's searing 715cd/m2.

The small, 3.1in size is also a problem. It's the smallest display of any phone on test, and tasks such as browsing websites feel cramped. It feels a little awkward swiping from the bottom of the screen to back out of apps and get to the BlackBerry Hub, with your thumb brushing the top row of the keyboard as you do so. Some games don't work well on the oddly-shaped, square display either, especially those needing extensive touch control, since your thumbs obscure the action.

Under the hood, the Q10 sports a powerful-sounding 1.5GHz dual-core TI OMAP 4470. Unfortunately, it exhibits all the same flaws as the Z10. The OS gesture animations are fluid, but elsewhere things aren't so rosy. Juddering frame rates ruin games, and our experience is reflected in the benchmarks. The Q10 completed the SunSpider test in 1832ms, scored 402 in Peacekeeper and recorded 1700 in Geekbench. None of these scores come anywhere near troubling the top handsets this month.

With an average battery-life score of 60% after 24 hours and a middling 8-megapixel camera to go with the problematic performance, the Q10 certainly can't justify its premium price tag. The keyboard is excellent, and will prove a draw for BlackBerry devotees, but, for the most part, we prefer the Z10.

BATTERY LEFT AFTER 24HR TEST



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

OVERALL ★ ★ ★ ☆ ☆ ☆



- 1 Windows Phone 8 feels smooth and responsive
- 2 The 6.1-megapixel camera delivers balanced colours
- 3 A microSD slot allows up to 64GB of storage to be added

NOKIA LUMIA 720



AN EXCELLENT CAMERA AND THIS MONTH'S BEST BATTERY LIFE MAKE THE LUMIA 720 OUR FAVOURITE MID-RANGE SMARTPHONE

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

The Lumia 720 is Nokia's latest assault on the mid-range market, but you wouldn't know it from the outside: its build quality and design are better than we've seen from many flagship handsets.

The rear is made from high-quality, robust matte plastic, which curves gently around the edges of the device to the glossy black screen. As with the rest of the Lumia range, the 720 comes in a range of colours: the red you see here, plus black, white, blue and yellow versions. It's eye-catching whichever one you choose.

Build quality is excellent, with barely any give in the back panel. The screen is made from Gorilla Glass, and the panel isn't only tough; it's also hypersensitive, so can be used with gloves.

The 720 is slim and light: at 9mm it's one of the thinnest phones in the Labs, and its 128g weight makes it comfortable to carry around. Nokia has even seen fit to include a microSD slot, although the unibody design

means there's no battery access.

The 4.3in IPS screen is superb. The measured brightness of 625cd/m² is the second highest we've ever tested, and it's readable in full sunlight. The contrast ratio of 1157:1 ensures punchy colours. In fact, there's only one problem, and that's the resolution: at 480 x 800, it isn't as sharp as we'd like at this size, especially when the similarly priced Nexus 4 has a 768 x 1280 display.

The phone's 1GHz Snapdragon S4 Plus processor and 512MB of RAM don't race through the benchmarks, with the 720 recording SunSpider and Peacekeeper results of 1438ms and 221 respectively. But thanks to its Windows Phone 8 OS, the Lumia never felt less than fluid in day-to-day use, and top-end games such as Asphalt 7: Heat ran flawlessly.

Screen resolution and all-out performance are this phone's only major weaknesses, though. Battery life is superb, with the Lumia 720 reading 80% on the gauge after our 24-hour test. There's 8GB of storage, NFC, and Nokia's excellent software

bundle: Here Maps and Drive deliver satnav and downloadable maps, Nokia Music offers free streamed music, and there's Microsoft Office software as well.

The Lumia 720's camera is among the best of any mid-range phone – a tad better than the Nexus 4's. Although the 6.1-megapixel resolution isn't anything special, our test photos looked great, with balanced colours and little distracting noise. We did experience the odd mis-focus, but this is a minor issue, and the macro mode worked well.

The Nokia can't compete with the Nexus 4 on screen resolution or screen size, but it has better screen quality, battery life and a slightly superior camera. The Nokia Lumia 720 is currently cheaper, which gives it the edge – it's a phone worth switching from Android for.

BATTERY LEFT AFTER 24HR TEST



PERFORMANCE
BATTERY LIFE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL





- 1 The SP's translucent "chin" lights up to show messages have arrived
- 2 A softer design makes the SP more comfortable to hold than its big brother, the Xperia Z

SONY XPERIA SP



SONY'S MODEST XPERIA IS WELL PRICED AND HAS EXCELLENT BATTERY LIFE, BUT MIDDLING CAMERA QUALITY AND A LOW-CONTRAST SCREEN PUT PAID TO ITS CHANCES OF AN AWARD

PRICE \$400
SUPPLIER www.sony.com.au

The Xperia SP isn't a flagship phone, but on paper it looks good for a mid-range device: Sony has evidently addressed some of the major issues we had with the flawed Xperia Z.

It's still quite boxy, but the sharp edges of its bigger brother have been softened, the sides slope in a bit, and the white rear panel is slightly curved, rather than flat. The changes, when combined with the SP's more modest dimensions (it's 4mm narrower and 9mm shorter than the Xperia Z), make this a much more comfortable smartphone to hold. Although it doesn't have the waterproofing and dust resistance of the larger phone, it's still a sturdy bit of kit.

The white panels and aluminium border help the SP stand out, but its headline design element is the translucent bar at its base, which lights up in different colours to indicate various notifications – emails,

text messages and so on. It's more interesting than a standard LED, but we're glad it can be turned off – it glows far too brightly to leave on a bedside table.

Inside, the phone has a Snapdragon S4 Pro CPU, clocked to a beefy 1.7GHz, and this helped it deliver a solid set of benchmark results. In fact, the Xperia SP is as quick as the Xperia Z, and feels smoother and more responsive.

Perhaps more impressive than this is the SP's big battery. At a capacity of 2370mAh, it beats most other phones of this size. In our battery-life tests, it had 70% remaining on the gauge after a day of use, which places it in the upper echelons of this Labs – the Nokia Lumia 720 was the only phone to gain a better result. There are no gaps in the rest of the specification either, with NFC, 4G and a microSD slot all on offer.

The 4.6in screen is considerably smaller than the 5in Xperia Z and Samsung Galaxy S4, but the 720 x 1280 resolution ensures text and images are crisp. It's bright, too: with

our colorimeter we measured it at a maximum of 463cd/m2, which is roughly on a par with the Nexus 4 and HTC One. In common with other smartphones in Sony's lineup, though, the brightness is undermined by a low contrast ratio of 526:1. That makes colours look flat and washed out when compared with the other smartphones on test.

We like Sony's camera app, and the 8-megapixel shooter captured richer colours than the Lumia 720's did. Overall, though, quality isn't as good.

All in all, the Sony is a great mid-range phone at a good price. Its battery life and design impress, and the low-contrast screen is its only real weakness. However, with such intense competition in the mid-range sector, that's enough to put it just behind the Nexus 4 and the exceptional Nokia Lumia 720.

BATTERY LEFT AFTER 24HR TEST



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



- 1 The angular edges don't sit comfortably in the hand
- 2 The Xperia Z is both shatter-resistant and waterproof
- 3 Flaps cover every port, making plugging in an annoyance

SONY XPERIA Z



A STRIKING PHONE THAT'S AS TOUGH AS OLD BOOTS, BUT SONY'S RUGGED FLAGSHIP LAGS BEHIND THE LEADERS IN TERMS OF SCREEN QUALITY AND PERFORMANCE

PRICE \$600
SUPPLIER www.sony.com.au

The Xperia Z is one of three phones this month with a Full HD screen, but that isn't the most interesting thing about Sony's flagship smartphone. Despite the glossy exterior and slender frame, it's the toughest phone in this Labs.

The front and rear panels and all of the edges are made from shatter-resistant glass, and it's held together in a frame of glass-fibre polyamide. It's exceedingly sturdy, and that isn't its only party trick: it also adheres to the IP57 standard, which means it's protected from dust ingress and will survive water submersion at a depth of one metre for 30 minutes.

The Xperia Z isn't without fault, though. Its squared-off edges mean it isn't as comfortable in the hand as the HTC One or the Samsung Galaxy S4, and the waterproofing means every port is hidden behind a rubberised flap. Having to flip open a flap every time you want to charge the phone or

connect headphones is irritating.

The Xperia Z's Full HD display is initially impressive. The sheer sharpness of images and text is something to behold, and since it's squeezed into a 5in display, the pixel density is incredibly high – 441ppi. Quality, however, isn't a patch on its main rivals. The HTC One is almost 20% brighter than the Xperia's 409cd/m², and the perfect contrast and saturated colours of the S4's screen make the Sony look flat.

Inside, the Xperia Z has a Snapdragon S4 Pro CPU and, when combined with 2GB of RAM, it helped the phone return excellent benchmark results, with scores of 7744 in Quadrant and 1911 in Geekbench. That's more than enough power to handle Android and top-end games, with Shadowgun, Dead Trigger and Reckless Racing 2 playing flawlessly. In the race to the top, however, it lags behind the leaders again, with the HTC One and Galaxy S4 better still.

The Xperia Z does surpass the leaders on battery life. The capacious 2330mAh power pack had 70% of its

capacity remaining after our 24-hour rundown test, with its rivals on 60%. There are no holes in the specification, either: dual-band 802.11n Wi-Fi, 4G and NFC come as standard.

The Xperia Z's 13-megapixel camera is excellent. Images are packed with detail, and the camera app is superb, with masses of options to play with.

Sony's custom Android UI is a mixed bag, however. It's based on the older Android 4.1.1, and while there are neat touches, such as the lockscreen's music controls, there's a lot of fluff. There's no reason to use the Walkman music player over Android's stock software, for instance.

The Xperia Z isn't a bad phone – not by a long shot – and its price means it shouldn't be discounted, especially if you're accident-prone, but it lags behind others in terms of screen brightness and the quality of its UI.

BATTERY LEFT AFTER 24HR TEST



PERFORMANCE
BATTERY LIFE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



APPLE IPHONE 5



NO LONGER KING OF THE HILL, THE IPHONE'S POWER IS ON THE WANE – AND IT'S OVERPRICED

PRICE From \$799

SUPPLIER www.apple.com/au

Apple's iPhone has been at or near the top of our A-List since the first model landed in 2007, but this year marks the first year it finds itself on the slide.

The reason? It's fallen behind the times. iOS, once the darling of the smartphone world, is looking distinctly cluttered and old-fashioned. And unlike HTC and Samsung, the limited iPhone range offers nothing for those who want a larger screen.

This won't matter to most iPhone fans, who will have made a big investment in apps and games over the years. For them, it's a case of buying the latest model, waiting two years for their contract to expire, and buying the next one.

And there isn't anything fundamentally wrong with what the iPhone 5 offers. Its aluminium chassis

is attractive: thin, light and far more pocketable than the huge Android handsets that dominate this Labs. Its performance can't be faulted, with the top score in Peacekeeper and third-best score in SunSpider.

When it comes to features: the only thing missing is NFC, and even that isn't a big negative. Battery life is average, with 60% remaining after our 24-hour test, but it will get you through the day.

All that, however, is no longer enough in today's ultra-competitive market. Previously, we felt the iPhone justified its premium, with its all-round competence and superlative App Store giving it the edge. This time, the competition's hardware is better, Android is slicker, and Google Play is

BATTERY LEFT AFTER 24HR TEST



now mature enough to compete on equal terms.

The simple fact is that the iPhone 5 is the second-most expensive phone in this Labs. Alas, since it isn't the second-best phone, we just can't justify recommending it.

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

NFC EXPLAINED

You'll have seen the acronym NFC bandied about all over the place for the past year or so. It's a feature that's becoming increasingly common in top-end phones, and will most likely become ubiquitous very soon. The question is, should you care?

NFC stands for "near-field communication", and it's a set of standards and technologies that allows smartphones and other devices to establish a wireless link when they're placed in close proximity to each other. Typically this is when two NFC devices are placed in physical contact, but the standard allows for activation at distances up to 10cm. Essentially, it's a more advanced, two-way equivalent of one-way RFID systems, such as contactless smart cards.

It's important to understand, at this point, that although data can be transferred over NFC, you won't be transferring significant amounts of data: an NFC link operates at 13.56MHz and a maximum speed of 424Kbits/sec. Even Bluetooth data rates are faster than this, at up to 3Mbits/sec.

Instead, the big hope for NFC is that it will be used for contactless payments,

but that's a long way from becoming a reality. Right now, the principal, and most practical, applications for NFC are pairing – transferring small amounts of data such as web addresses and business cards – and tagging.

Pairing with NFC is a simple concept – it's designed to make the process of connecting to a Bluetooth device quicker and easier. Bring two NFC devices close together and they'll "handshake" and set up a Bluetooth link automatically, with no scanning or code entry required. We tried it with the Nokia Lumia 920 and a pair of Jabra Revo headphones and it worked like a dream.

This is also how Android Beam and Samsung's S Beam work. Bring two compatible smartphones together, back to back, and they'll establish a Bluetooth link, allowing you to quickly transfer documents, photos and other files.

Tagging involves the use of special NFC fobs or stickers to trigger various actions on your phone. An NFC tag stuck to your bedside table, for instance, could be used to put a phone in silent mode and launch the alarm clock app. A tag on your office

desk could be used to switch on Wi-Fi and turn off mobile data. NFC tags are very cheap and widely available online – all you need once you've bought some is an app to write to the tags and manage the triggers.

It's a start, and the technology has potential, but the fact is that, right now, NFC is hardly a killer feature, and certainly no deal-breaker if the phone you're thinking of buying doesn't have it. We wouldn't worry about it until NFC apps become more compelling.

► NFC can be used to pair, and send photos between, phones



BLACKBERRY Z10



THE Z10 IS AN EXCELLENT MESSAGING PHONE, ALTHOUGH IT LACKS THE BREADTH OF APPS TO MAKE IT A TRUE CONTENDER

PRICE \$580
SUPPLIER au.blackberry.com

BlackBerry took its precious time getting the new BlackBerry 10 OS ready; when it did, the Z10 was the first recipient.

For a flagship device, the specification isn't exceptional. The 4.2in, 768 x 1280 IPS display wasn't cutting edge when it launched, and it's fallen further behind the leaders in recent months. The 1.5GHz dual-core processor, 8-megapixel camera and plasticky, angular build are equally so-so. It was the new BlackBerry 10 OS we were really waiting for, however, and we still like it. The way the OS puts both messaging and multitasking at the forefront of everything – via the BlackBerry Hub – makes sense, and its novel yet intuitive gesture-based navigation is highly effective.

We also love the BlackBerry Z10's super-bright display. We measured it kicking out up to 715cd/m2, making it

the most readable phone we've come across in bright sunlight.

The Z10's main weakness is apps. It launched with a respectable number in its store, with major apps promised



from names such as Skype, Spotify and Amazon. However, only a few of these have materialised since. It's possible to fill the gaps by "sideloading" unofficially converted Android apps, but these often suffer from poor performance.

The Z10 didn't do well in our benchmarks or games tests, either. Although the OS itself felt responsive, we experienced dropped frames on fast-paced 3D titles, sluggish scrolling in some settings screens, and benchmark results were below par. Its 1902ms SunSpider result is well down the table this month.

In the end, though, it's the flagship pricing that proves the decisive factor for the Z10. Asking almost \$600 for what feels like a mid-range phone seems a fraction too much.

BATTERY LEFT AFTER 24HR TEST



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

OVERALL ★ ★ ★ ☆ ☆ ☆

HTC WINDOWS PHONE 8X



A GOOD TURN OF SPEED AND PLEASANT DESIGN ARE MARRED BY THE POOR SCREEN AND BATTERY LIFE

PRICE \$330
SUPPLIER www.htc.com/au

The Windows Phone 8X sits at the top of HTC's Windows Phone 8-based roster, but in the company of the phones in this Labs, it's more of a mid-ranger, with a 4.3in screen and dual-core processor.

It's very quick, though. Its 1.5GHz Snapdragon S4 CPU blitzed the SunSpider test in a time of 913ms, and it scored a reasonable 340 in Peacekeeper. That's better than the Nokia Lumia 720, and as usual Windows Phone 8 felt smooth and lag-free. The rest of the specification has plenty to offer, with 4G, NFC and dual-band Wi-Fi. Its 1GB of RAM and 16GB of storage are double the Nokia's complement, although there's no microSD slot.

The HTC's 8-megapixel camera is good, with plenty of detail captured in standard snaps, and an excellent

macro mode.

Design-wise, it ticks all the right boxes. Like the Lumia, it's constructed from a unibody polycarbonate shell,



with gentle curves that reach around to meet the Gorilla Glass panel upfront. We like the grippy matte finish, and, if you don't like the blue of our review sample it's available in three other hues.

The 4.3in, 720 x 1280 IPS display lets the HTC down. Although it has more pixels, it's much dimmer than the Nokia Lumia 720's, with a maximum brightness of only 366cd/m2. The biggest issue with the 8X, however, is the 1800mAh battery, which had only 50% capacity remaining after our 24-hour rundown test.

The HTC 8X may be fast and good-looking, but its screen and battery aren't quite up to scratch. If you want the best-quality mid-range phone, go for the Nokia Lumia 720.

BATTERY LEFT AFTER 24HR TEST



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

OVERALL ★ ★ ★ ☆ ☆ ☆

HUAWEI ASCEND W1

A LOW PRICE AND DECENT BATTERY LIFE, BUT THE NOKIA LUMIA 520 HAS A BETTER SCREEN AND DESIGN

PRICE \$230
SUPPLIER www.huawei.com.au

The Huawei Ascend W1 trades blows with the Nokia Lumia 520 for the title of the month's cheapest handset. While not officially available in Australia, it can be had through grey importers and thanks to pricing is about as close to a direct competitor as Nokia can get.

Compromises have to be made to produce a phone this cheaply, though, and Huawei has plumped for cutting back on the physical luxuries. It isn't as stylish as the Lumia 520, and the rear cover can't be replaced with more colourful alternatives. That said, the battery is removable, and it has a microSD slot.

The screen isn't as good, either. The Huawei shares a 4in diagonal and 480 x 800 resolution with the Lumia, but its 313cd/m² top brightness lags behind the Nokia's 352cd/m². The W1's

screen is vapid, too, with colours that generally lack clout.

On the positive front, the W1's Snapdragon S4 processor is 200MHz quicker than the chip inside the Lumia, and this helped the Ascend score an impressive 1129ms in the SunSpider benchmark. We didn't experience any performance issues in real-world use: the OS was smooth under the finger, and 3D games didn't struggle. Battery life is good, too, with 70% of its capacity left after our rundown test, again better than the Lumia.

Give the rest of the specification the once over and the W1 falls behind. Storage is a miserly 4GB, the 802.11n Wi-Fi is single-band only, and there's no sign of NFC. The 5-megapixel

BATTERY LEFT AFTER 24HR TEST



camera has an LED flash, but quality is poor. Colours are rich to the point of oversaturation, and heavy compression smears fine details.

The Ascend might be one of this month's cheapest phones, but it just misses out in the battle for the title of best budget smartphone. We prefer the Nokia Lumia 520.

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

NEXUS 4

A SUPERB MID-RANGE CHOICE WITH A TOP-QUALITY SCREEN AND GUARANTEED ANDROID UPDATES

PRICE From \$349
SUPPLIER play.google.com

The Nexus 4 is Google's most successful handset: it sold out within 15 minutes when it first went on sale on Google Play, and there are several good reasons why so many were keen to get their hands on one.

For starters, the prices: the 8GB and 16GB versions are available outright for \$349 and \$399, around half the price of high-end rivals. Then there's the software: the big attraction of Nexus handsets is that they always receive the latest Android updates, as they're issued by Google.

The Nexus now runs Android 4.2, which boasts a raft of improvements over older versions of the OS. Our favourite feature is the brilliant new keyboard, which boasts highly effective Swype-style gesture-typing.

The phone's LG-made hardware is just as smart. The glass rear shimmers as it catches the light,

and the Gorilla Glass front panel is surrounded by a chrome-effect border. It's comfortable in the hand, weighs a reasonable 139g, and isn't far behind this month's slimmest phones, at 9.1mm.



One point against it, however, is that it's a sealed unit, so you can't add storage or replace the battery. Another is its 1.5GHz quad-core Snapdragon S4 Pro CPU, which produced this month's slowest SunSpider time. The Nexus 4's 4.7in 768 x 1280 display is great, though. The IPS panel lends colours a natural tone, and a maximum brightness of 486cd/m² puts it fourth this month. The Nexus 4's 8-megapixel camera is also decent: behind the quality of the Lumia 720, but not by much.

The Nexus 4 represents excellent value, no matter how it's purchased: Although at this cost we'd suggest that the 16GB model is the only one worth considering. It's only the presence of the excellent Nokia Lumia 720 in this Labs that robs it of an award.

BATTERY LEFT AFTER 24HR TEST



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

NOKIA LUMIA 520



GOOD BUILD QUALITY AND A DECENT SCREEN COMBINE TO MAKE THIS THE BEST BUDGET HANDSET AVAILABLE

PRICE \$180

SUPPLIER www.nokia.com.au

We've been impressed with Nokia's recent mid-range handsets, but its Lumia 520 makes a play for the budget market, dropping the price to only \$180 and making it available on cheap contracts. That's a tiny sum for a current-generation smartphone, and the Nokia doesn't make any fatal compromises.

Nokia's traditionally excellent build quality is retained here, with a sturdy plastic shell moulded into a smart, curved shape. It's comfortable to hold, and the rear cover is removable, delivering access to a removable battery and microSD slot.

Under the hood is a Snapdragon S4 CPU – the chip of choice for this level of Windows Phone 8 handset. The 520's SunSpider and Peacekeeper scores of 1497ms and 223 respectively don't set the world alight, but the OS and high-end games felt snappy. Playing Asphalt

7: Heat felt smooth and judder-free.

Games look decent on the IPS screen, too, which serves up a 4in diagonal and 480 x 800 resolution. Its 352cd/m² top brightness is better than the Huawei's 313cd/m². Elsewhere, there's 512MB of RAM, 8GB of storage and a 1430mAh battery. This had 60% of its capacity remaining after our 24-hour rundown test, which is average.

The only weak point is the camera. There's no flash, and image quality is poor, with flat colours and a distinct lack of sharpness in our test shots.

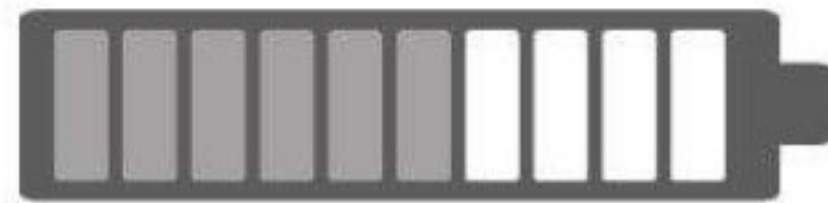
The Lumia 520's suite of Nokia software saves the day, though, with Here-branded Maps and Drive apps offering free turn-by-turn satnav and



downloadable maps, and Nokia Music for entertainment. The bundled Office apps are a boon, too.

All told, the Nokia Lumia 520 is a bargain: it's well designed, responsive and packed with useful software. If money's tight, there's no better handset on the market.

BATTERY LEFT AFTER 24HR TEST



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

OVERALL ★★★★★

NOKIA LUMIA 920



A SUPERB CAMERA, BUT POOR BATTERY LIFE AND A HEAVYWEIGHT DESIGN KNOCK THIS PHONE OUT OF CONTENTION

PRICE \$450

SUPPLIER www.nokia.com.au

The Lumia 920 makes a big impression, and not only because of its striking polycarbonate design – it's also one of the chunkiest smartphones around.

The Nokia's build quality is exceptional, though. It's milled from a single block of polycarbonate, the convex rear is comfortable in the hand, and the buttons lined up on the right-hand side fall nicely under the fingers when it's held in the left hand. It's extremely sturdy, and we suspect it will keep its looks longer than most rivals.

The Lumia 920's 8.7-megapixel PureView camera is its biggest draw. Image quality is exceptional: colours are balanced, detail is pin-sharp, and optical image stabilisation means low-light shots are brighter and more detailed than those of any other phone save the HTC One. Macro shots were

sharp, too, and the stabiliser worked well to smooth out handheld video.

The screen's 768 x 1280 resolution ensures images and text look sharp. The 427cd/m² top brightness makes

for a screen that's readable in most conditions, and the contrast ratio is fine at 711:1. It isn't as good as the HTC One, though, which hits 481cd/m² and 1313:1.

The 920's Snapdragon S4 CPU doesn't sound impressive, but the Lumia 920 scored 920ms in SunSpider – the second-best time in this Labs – and real-world performance was slick, with no slowdown when navigating the OS or playing 3D games. Battery life is poor, though. The Lumia had 40% remaining after our 24-hour test – this month's worst result.

That, the weighty design and a high price bump down this Nokia this month. The camera is excellent, but the Lumia 920 doesn't have enough else in its locker to win an award.



BATTERY LEFT AFTER 24HR TEST



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

OVERALL ★★★★★



The best reason to buy an iPad

Your favourite technology magazine now has an iPad edition featuring everything you love in the magazine plus exclusive extras each month including additional photography and video. Change the way you view your tech. Head to iTunes now to download the app.

VIEW FROM THE LABS

In the past ten years, we've seen periods of domination by several smartphone platforms. First came RIM and its BlackBerry handsets, then Microsoft's Windows Mobile and Symbian took over, followed by iOS, and more recently Android, with Samsung's Galaxy S smartphones ruling the roost.

This month marks another change in the winds, with HTC nudging in front of Samsung in the race for top honours.

It's exciting stuff, but while the big boys slug it out at the top table, the most significant developments are taking place elsewhere. Slowly, stealthily, Nokia is dragging Windows Phone 8 into the mainstream, and it's doing so, not by competing at the high-end, but by creating a steady stream of more affordable, high-quality smartphones.

This month, both the mid-range Nokia Lumia 720 and the budget Lumia 520 walk away with awards, a first for any Windows Phone handset in our Labs. Both are sensibly priced, perform well, couple attractive design with a responsive and usable OS, and include a package of preloaded apps that would have had us drooling a couple of years ago. In fact, we think these phones might be setting the scene for the next big shift in the smartphone sector.

Right now, apps and games for Windows Phone 8 aren't anywhere near as numerous, or as high in quality, as those available to Android and iOS smartphone owners. Gradually, though, the big names are relenting and starting to recognise the platform's potential. Spotify is now available

on Windows Phone 8 after a seemingly interminable wait; there are official Skype and Flickr apps; WhatsApp is there, too; and even some of the more esoteric titles have made their way onto the store.

This is significant: as long as Microsoft and Nokia play their cards right, in a couple of years, with the store fully fleshed out, there should be a whole mass of consumers who have grown up with solid, dependable budget and mid-range Nokia Lumias. These people will be gagging to move onwards and upwards to more rarefied hardware. At

this point, the difference between Android, iOS and the Windows Phone app stores is likely to be smaller than ever, and the shifting platforms much less attractive.

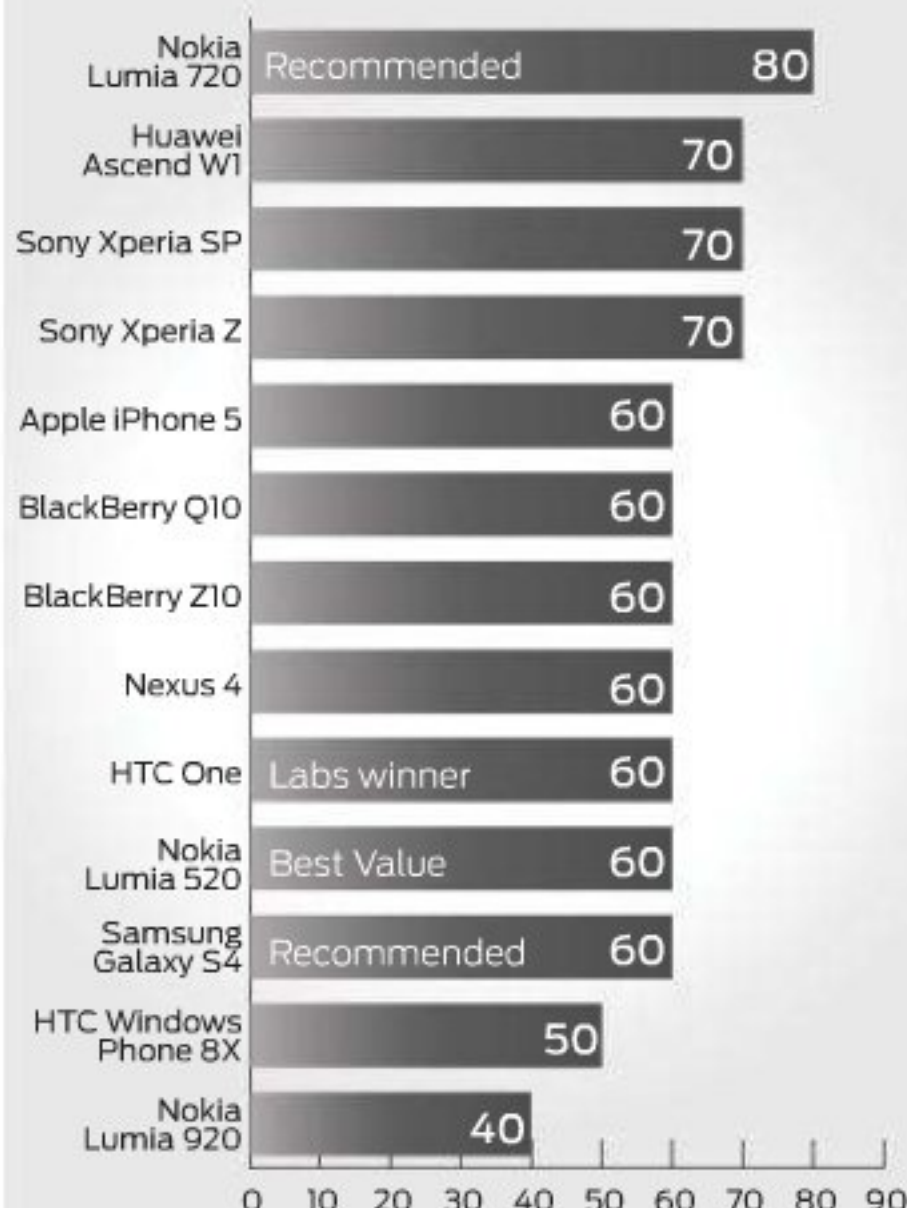
For now, we expect the HTC and Samsung hegemony to continue, perhaps interrupted by a comeback from Apple when the next iPhone appears later this year. But the signs for Windows Phone are good, and if Nokia can follow up with a high-end handset that runs the leaders close, we wouldn't be surprised to see another change of direction. Bring it on.

“In a couple of years, there should be a mass of consumers who have grown up with Nokia Lumias”



BATTERY LIFE

% remaining after 24 hours



SUNSPIDER BENCHMARK

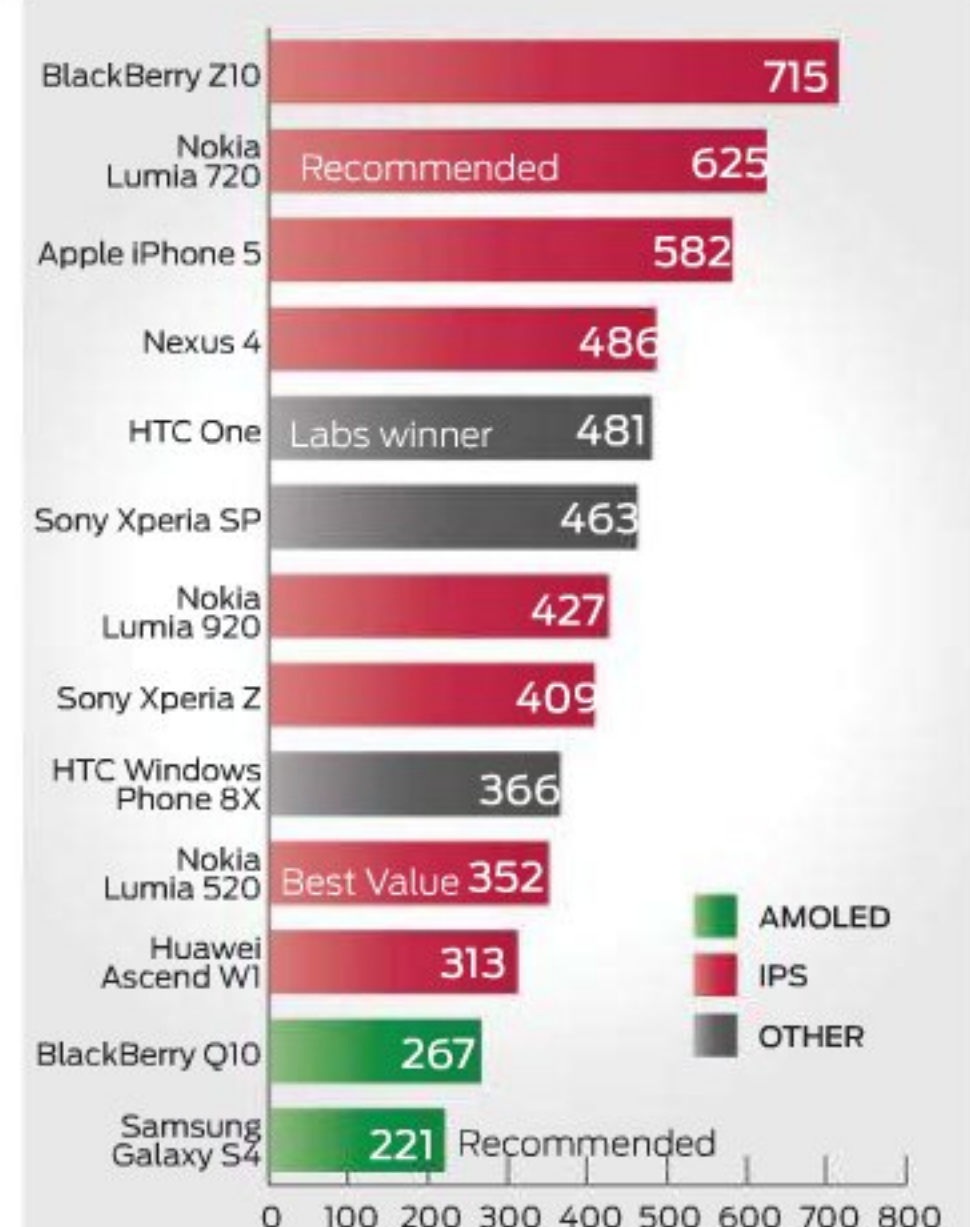
Average time taken (ms)



LOWER IS BETTER

MAXIMUM SCREEN BRIGHTNESS

cd/m²



AMOLED
IPS
OTHER



THE BUREAU: XCOM DECLASSIFIED PREVIEW

WE GO HANDS ON WITH THE XCOM SHOOTER,
AND TAKE THE FIGHT TO THE ALIEN MENACE

DEVELOPER Irrational Games
PUBLISHER 2K Games
WEBSITE www.thebureau-game.com

We've been seeing Bureau: XCOM Declassified at E3 for a couple of years running now, but after the 2012 show it went remarkably dark, until the shooter showed up again this month. The game's undergone what looks like a pretty stealthy redesign, with a much more intuitive orders system, and a slight change in art direction.

We got some hands-on time with the game last week at 2K's local offices, and before the cleaners kicked us out of the building, we grew to like what we saw.

Getting into a game demo can be tough when you're plopped into the middle of a story, a few levels in and without any guiding tutorials or learning curve. Thankfully, the controls are mostly intuitive, and the orders system for our two teammates slows down time so you can relax (a little) over how best to deploy troops and their abilities.

Like the XCOM strategy game, that's very much the meat of the game's combat.

Our playthrough saw us searching a small town taken over by aliens (a race of slavers, here to literally steal our women), in order to find one of

our own agents, and to reach an alien tower structure. We didn't quite get that far (they have tough-looking cleaners at 2K), but we got a good slice of the on-the-ground action.

Sadly, we didn't get to see the planning and upgrading side of the game, but we've been told that, while it's not as in-depth as XCOM, it's still pretty deep.

The action in The Bureau is very much third-person, and heavily focused around cover, so it's really



PLATFORMS

PS3 • Xbox • PC
Previewed on PC



going to live or die by how responsive the controls are. It was hard to get a handle on that, as we were playing on an Xbox controller, even though the game was plugged into a PC. Still, at least we could see how good the game looked – it's no Crysis 3, but it has some great design flourishes and some sharp texture work.

The action does seem a little linear, though. Like a lot of cover shooters, the areas you move through tend toward long, narrow, clutter-filled environments, with maybe a side-path or two, leading to each of our encounters feeling a little samey – you order your engineer to set up a laser turret, get your other dude to pull off a wave power that pushes back enemies, and then push up, rinsing and repeating as necessary.

These travelling fights are broken up by set-piece battles which bring a little more flavour. In the level we got to play the first objective is to relieve the lost agent, who's holed up in a barricaded building that he's surrounded with explosives – once this fight kicks off, you gain the ability to call the agent and get him to detonate each device. Once the building is cleared, you then have to defend it against incoming waves of ever-tougher enemies, and can again call on your bomb-happy pal.

Then it's back to cover-filled lanes to the next plot-point.

Even in our limited play-through there was a range of weapons on offer, from conventional Earth rifles and pistols to scavenged plasma and laser weapons. You can customise the loadouts of yourself and your squad both before the level, and at certain checkpoints throughout.

We really felt as though we were seeing just a part of what The Bureau has to offer, and without the full sense of research and progression of the completed game, it's hard to judge what the final outcome will be like. But it is great to finally get some hands-on time with the game, and we're cautiously confident the final product will have the classic XCOM feel.

David Hollingworth

CALL OF JUAREZ: GUNSLINGER

UBISOFT TRIES ONE MORE TIME WITH ITS JUAREZ FRANCHISE, AND MAY HAVE JUST RELEASED THE BEST GAME YET.

DEVELOPER Techland
PUBLISHER Ubisoft
WEBSITE <http://callofjuarez.ubi.com>

There's a lot to be said about throwing the established tropes of a series out the window, and starting from scratch. In some ways, that's exactly what Ubisoft tried with the last Call of Juarez, when it kept the Western feel of the game, but tried to transport it into a modern setting, pitting players against Columbian drug cartels. It was a bold move, and would have been even bolder if it had worked.

Instead, it just came out even more moribund and stale than the series usually is.

Call of Juarez: Gunslinger, however, removes a different element, while adding something wholly fresh and unexpected. It keeps the Western setting, but adds in an unreliable narrator, and a sense of humour that is positively welcome. And at only \$20, it's a bargain for some fun shootin'.

WAIT, WHERE WAS I?

Unreliable narrators are nothing new in fiction. It's a well-used trope in books and films, most especially the

Shane Black/Robert Downey Jr flick Kiss Kiss Bang Bang. It's hard to do well, however, as the ability to trust any story we're being told is usually essential. If the story is constantly changing, it can get frustrating for the reader or viewer – or gamer. Done well, and it becomes a delightful story-telling tool.

In Kiss Kiss Bang Bang, Downey's constant revising of his life story is charming, in part because of the actor's skill, but also the director's talent. In a game, it's actually far more powerful, as the action can literally change around the player. It's something used for great affect in the new Borderlands 2 DLC, and it works just as well in Gunslinger.

The game is the life story of hoary old gunfighter Silas Greaves, as he relates his two-fisted tale to a room full of admirers in 1910. He takes the story back to his times running with Billy the Kid and other famous figures of the Old West, but his memory ain't what it used to be, and it's rather obvious that he's a believer in tall tales, rather than true. He enlarges the story, introduces new characters and elements, and even goes back to change his mind.

What makes this fun is that it all



happens as you're playing it. The idea of endless villains and thugs that seemingly come out of nowhere is a tired old trope in games, but here it's played for laughs.

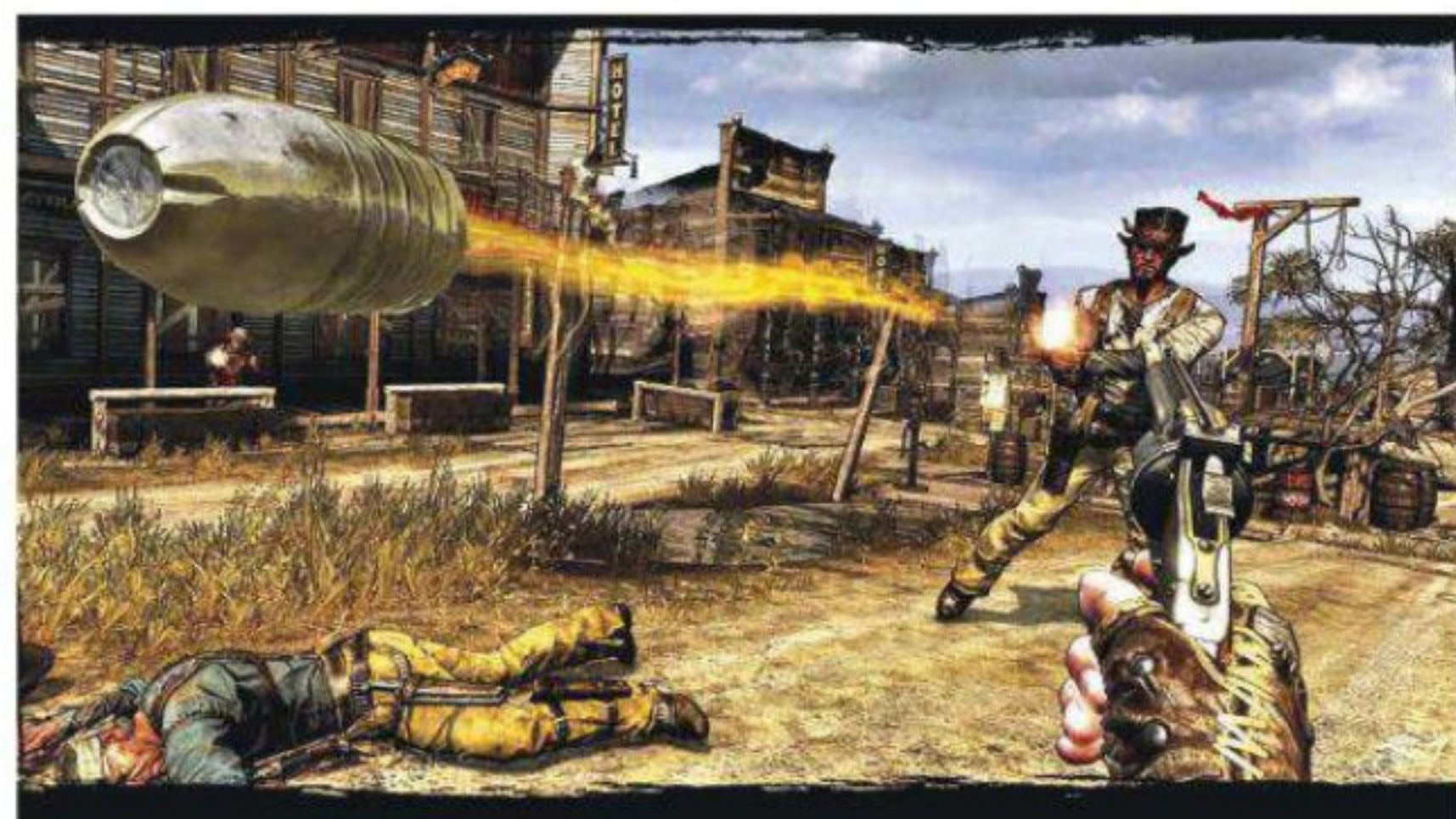
It's truly nice to play a game that doesn't take itself seriously.

As a shooter, the game's not quite as pleasing as the storytelling gymnastics, but it's a lot of fun nonetheless, with some unique elements amongst the usual run-and-gun tactics. There's a range of satisfying weapons to gun down people with, and Gunslinger's take on man-on-dude shootouts has a suitably dramatic timing mechanic. You can also drop into the inevitable bullet-time analogue, which is a necessity when swamped by the simple but still effective AI. What's new is the ability, when you're suitably pumped up by downing varmints, to sway out of the way of incoming fire. When this happens, time slows as a bullet is blasted at you, and you can use Q or E to dodge languidly aside. It feels suitably epic and over the top.

All the while, you're racking up points for shooting folk (and the odd chicken – exploring what scores points in the game is fun, if a little... cruel). Headshots and creative uses of scenery score more points, and it's compelling enough. But the little bubbles of numbers can get in the way – when you shoot a dude off a water tower, sometimes you just want to watch that, not the score and achievement you just unlocked.

It's really great to see the sudden sense of humour that Ubisoft's exhibiting in games like this and its DLC for Far Cry 3, Blood Dragon. Borderlands has shown us that a game doesn't have to be packed with Grim-dark to be a success, so we hope to see more games that show the same kind of comedy.

David Hollingworth



PLATFORMS

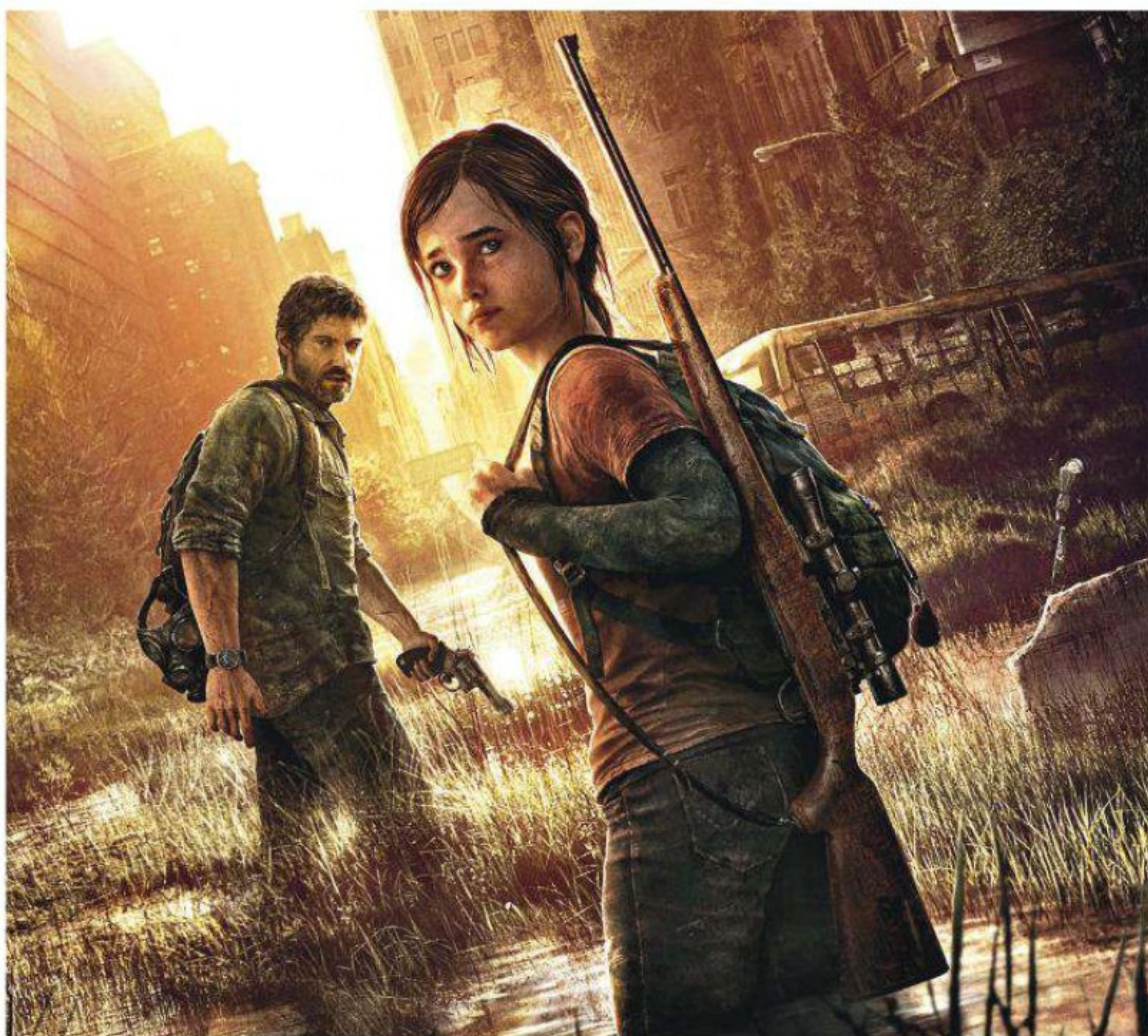
PS3 • Xbox • PC
 Previewed on PC

atomic

Well worth the paltry asking price.

RATING





THE LAST OF US

A LANDMARK GAME IN TERMS OF STORYTELLING
AND THE SPARSENESS OF ITS GAMEPLAY

DEVELOPER Naughty Dog
PUBLISHER Sony
WEBSITE www.thelastofus.com

There's not a lot of fun to be had playing The Last of Us. There's beauty to be found in the game, in urban environments being taken over by a rampant, unchecked natural world, and in entirely natural environments that are now thriving following a massive die-off of humanity. There's action and tension aplenty, a world to explore, and compelling characters.

Just... there's not a lot of fun to go with it. And, honestly, that straight-faced lack that is one of The Last of Us' best and most defining elements.

The story has its twists and turns, but in some ways it's not all that original. In a world that's been destroyed by a runaway fungal plague that either kills you or turns you into a shambling zombie analogue, a gritty and morally dubious gun-runner must escort a 14-year old girl from point

A to point B. Along the way, both of them change – and not necessarily for the better.

The game's mechanics cover familiar ground. There are sections of cover-based shooting, stealth-based challenges to overcome, and of course crafting of goods from scavenged items found in the forgotten and forlorn places of the world.

Even the core mechanic, of you needing to lead and protect a weaker partner, has been done before, in emotionally engaging games like Ico.



PLATFORMS
Only on PS3



However, all of these elements come together in a supremely confident way, and a handful of core development decisions ensure that nothing about the game can be taken for granted.

A lot of games probably spend too much time holding the player's hand, providing endless feedback as to the location of quest targets and NPCs, or providing other NPCs to constantly tell you what to do. (We're looking at you, Call of Duty!) The Last of Us, on the other hand, is practically stand-offish. The game's UI is minimal, almost non-existent. When you need to find a certain point on the landscape, it's highlighted in the world by a gold metallic sheen, such as a building in the distance being decorated with gold leaf. Paths are not obvious, leading to a lot of natural exploration, and sometimes you'll lose sight of your goal, feel lost, only to then glimpse it off in the distance, but tantalisingly closer. You'll backtrack a lot, but this helps fill out the picture of this disastrously empty world.



on offer mean you need to approach every encounter with a plan and sense of the surrounding area. Like crafting, you need to weigh up your tactical options with every encounter, because nearly every option will cost you some precious resource.

And that's not even considering the emotional pressure of your constant companion. Some of the most intense moments of the game come after a confrontation, when you realise you can't actually see Ellie.

The game's not perfect, though, not quite. At times we wished The Last of Us came with the same kind of narrative options as Mass Effect 3, where you could play the game either as pure action shooter, or pure narrative. A lot of the combat mechanics in The Last of Us are quite naturalistic, but sometimes the shift from intense drama to mere cover-based shooter is a little too jarring, taking you out of the story and into a game like any other. A clever AI, widely varied enemies, and some bold decisions in how to make that AI behave (watching someone run from you because you've pulled an actual gun is impressive) certainly help the game, but at times it would be great to be able to push through the combat puzzles in order to keep the story flowing.

Oh, and there's a more or less unnecessary multiplayer mode which, while clever, is really beside the point. It is fun, but without the constant dread and angst of the singleplayer, it's an ultimately empty experience.

The Last of Us is an amazingly bold game. Coming from a developer renowned for its wisecracking hero Nathan Drake, it's like a bolt of lightning from a cloudless sky (and other Alanis Morissette lyrics). It's not fun, per se, but it could be one of the best games you play this year.

David Hollingworth



Given how rare most items are, you'll want to be exploring anyway, and the moments where you realise the true worth of mundane items like rags and bottles of water are the moments when the bleak nature of the setting really hits home. You'll need these items to make multiple recipes, and even with just a few ingredients there's usually an array of options – this forces you to craft carefully. Do you turn rags and bottles into molotovs, for offensive action, or play more conservatively, and make bandages? And no matter your decision, at some point you will feel as though you've made the wrong one.

The other option is to hold on to ingredients until you know what you need, but the fact that crafting doesn't stop the game, and happens in real time, can itself lead to moments of tension. Actually, strike

that – moments of white-knuckle terror is a more accurate term. More than once we ran from some bloodthirsty enemy, only to find cover, hunker down, and hope we could make a bandage in time. Then we'd turn the tables, and win, but still feel

“A lot of the combat mechanics in The Last of Us are quite naturalistic, but sometimes the shift is too harsh.”

like we'd lost something in the long run.

More often than not, avoiding bad guys is the way to go, but obviously you can't always manage it. The limited weapons and ammunition



atomic

An outstanding achievement in storytelling and setting. Just, maybe don't play it alone or in the dark.

RATING





COMPANY OF HEROES 2

THE CLASSIC RTS RETURNS AND IS BETTER THAN EVER, AND WITH A WHOLE NEW RAFT OF CHALLENGES

DEVELOPER Relic
PUBLISHER SEGA
WEBSITE www.companyofheroes.com

In a gaming world where the rushing-tactic realities of StarCraft II's gameplay formula are the norm for real-time-strategy titles, it's about time there was a contender to the RTS crown where brains matters a whole lot more than digital brawn. Company of Heroes 2 is the long-gestated sequel to one of the most critically revered strategy titles of all time, and while a lot of it is familiar – albeit in a very, very good way – there is certainly more than enough here to warrant the '2' and push it far beyond what could have otherwise felt like Company of Heroes 1.5.

Even as a game set in the familiar locale of World War II, Relic Entertainment treads fresher ground by exploring the rich and tragic history of the battle for the Eastern Front in Soviet Russia. While a Western company's exploration of wartime Russia, in what eventually led to the beginnings of the Cold War, could have been both

exploitative and disrespectful, Relic treads a respectful path, even if the game-engine-powered cutscenes do lack the visual oomph that the rest of the game oozes. For a game that tells the story of an underdog Soviet officer who constantly battles with a vicious political hierarchy, this is a crucial consideration, especially considering Soviet military deaths were more than twice the number of any other nation in World War II.

As with the original game, authenticity is a core concern and is evident in Relic's attention to detail with unit design, historical accuracy and what will surely go on to be award-winning sound design. Cleverly, Relic has avoided the sim-like realism of Close Combat and forged a title

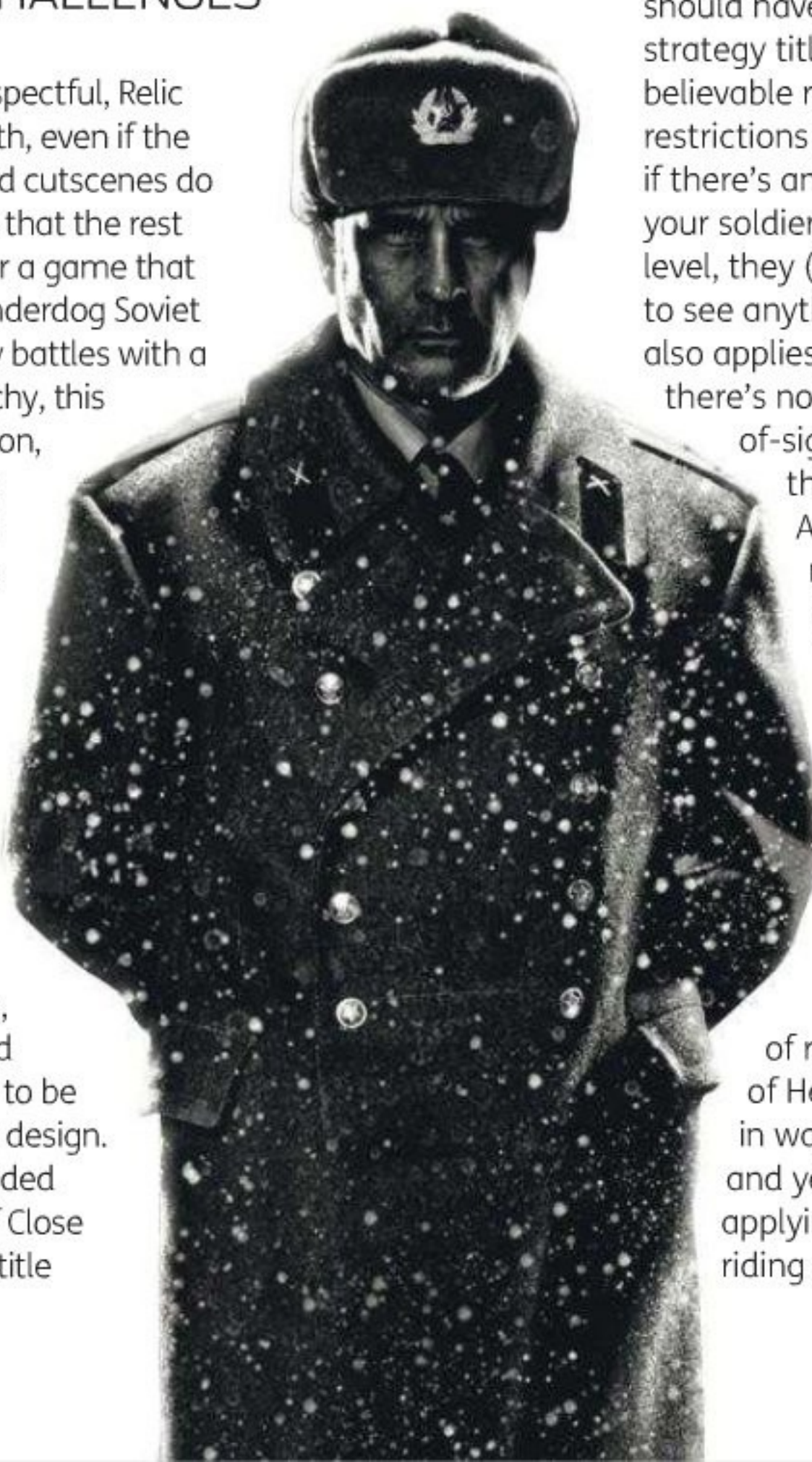
that almost perfectly merges balanced gameplay with historical realities. This is no small achievement, particularly given the inclusion of one particular game-changer for the RTS genre: TrueSight.

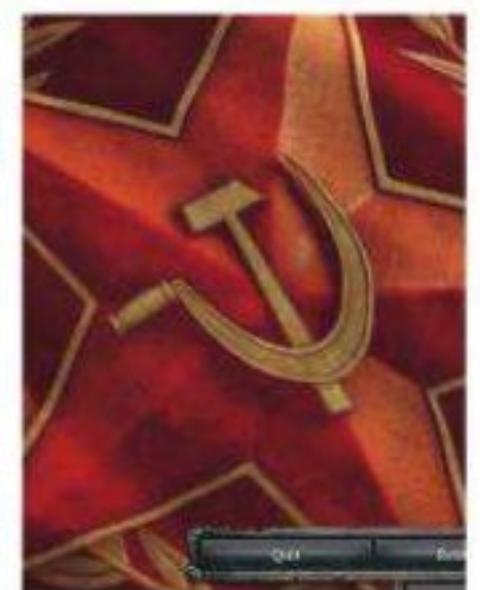
This technology – which, by rights, should have been integrated into strategy titles years ago – applies believable real-time line-of-sight restrictions to troops. Put simply, if there's an obstruction in front of your soldiers that's higher than eye level, they (and you) won't be able to see anything beyond it. This rule also applies to vehicles, which means there's no longer a persistent line-

of-sight circle that can see through absolutely anything.

Ambushes are now a deadly reality that potentially lurk around any corner; a logic that cuts both ways and can be used with deadly effect against careless opponents. Old habits do die hard, though, and it does take quite a while to get used to this brilliant new inclusion.

There's also a whole lot of rejigging of the Company of Heroes formula at play here, in ways that feel both organic and yet still make it seem like applying the familiar logic of 'like riding a bike' to the leap from





pushbike to motorbike. Commanders make a welcome return, but they all come with fixed tactics: a mixture of units, passive abilities and manually activated tricks that complement particular play styles. Units can now capture points in generously sized zones, meaning troops are no longer mortar-fodder when capping, while Engineers can construct fuel or munitions upgrades on generic control points to boost income. All units also arrive from a predetermined map location, effectively negating tactics of old whereby buildings were placed as close to the frontline as possible for speedier troop deployment.

More controversially, Company of Heroes 2 includes an 'Army Customizer' feature that allows players to perform

aesthetic tasks such as unlocking and applying vehicle skins, but also enables the application of so-called 'Bulletin' buffs to personalised Commander load-outs. These Bulletins need to be first unlocked by achieving certain in-game milestones (which are earned across modes), but then provide a marginal competitive edge for particular units. While this does allow a welcome depth of progression for fans that will sink scores of hours into Company of Heroes 2, it does present potential headaches for future balancing on the hardcore competitive space.

Couple this with a universal experience system that may artificially matchmake (no server browser this time around) players at a higher level simply because they finished the campaign,



and relatively green competitive players have the potential to be pitted against elite Company of Heroes veterans. On the plus side, latency concerns are seemingly a thing of the past, with an alpha- and beta-refined netcode that offers smooth gameplay, even against international opponents.

Thankfully, the multiplayer-cautious player can enjoy dozens of hours of gameplay before heading online. The first few missions of the 14-mission campaign act as extended training beyond the single tutorial mission and static training videos, but then the real game begins. Campaign missions can take anywhere from 30 to 90 minutes, depending on your skills and preferred tactics: aggressive play styles are often quashed by incredibly intelligent enemy AI, while defensive tactics can make maps run for hours. Throw in a variety of Skirmish maps and 'Theater of War' mode that offers co-op, skirmish and specific timed challenges, and there's a whole lot by which to be impressed in Company of Heroes 2. The wait was well worth it.

Rick Stone



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 have a look at the beta of this new release this issue, and we've found 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 670 W8

★★★★★

PRICE \$1635 SUPPLIER www.ticomputers.com.au

With an overclocked Core i5 CPU that delivers excellent performance and the excellent GeForce GTX 670, this is a great all-round performer for work and play.

SPECIFICATIONS Intel Core i7-3570K (clocked to 4.4GHz); 8GB DDR3 RAM; 120GB SSD; 2TB HDD; GeForce GTX 670; Samsung S24B300H 24in monitor; Windows 7. **WEB ID** N/A



GAMING ASUS ROG TYTAN CG8565 [HE]

★★★★★

PRICE \$4999 SUPPLIER www.asus.com.au

The best-performing Sandy Bridge gaming system that we've seen to date. Expensive, but well made and future-resistant.

SPECIFICATIONS Intel Core i7 2600K; 16GB DDR3 RAM; 80GB SSD; 2TB 7200 RPM HDD; Blu-ray writer; NVIDIA GeForce GTX 590; Bluetooth mechanical keyboard and gaming mouse **WEB ID** 297257



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 1.5GHz Tegra 3 CPU; 32GB internal memory; 4.7in 1280 x 720 sLCD screen; 8MP camera; 134.36 x 69.9 x 8.9 mm 130g **WEB ID** 296575



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 8.7 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.



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



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.



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; PPTP; 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 4800ppi 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

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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 680 TWIN FROZR OC SLI

PRICE \$1180

Great value, overclocks extremely well, super fast. While you only *need* one card, two cards double the amount of awesome in your system.



SUBTOTAL: **\$1675**

RIG ONLY: **\$1065**

COOLER



ANTEC KUEHLER 620

PRICE \$85
Water cooling is the future, today! These closed loop coolers make it much cleaner inside your PC case.

CASE



BITFENIX SHINOBI

PRICE \$80
Worth it for the price alone, and sexy to boot. A budget design that doesn't look cheap.

SYSTEMDRIVES

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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.

KEYBOARD

RAZER ARCTOSA

PRICE \$50

A cool-looking keyboard that'll serve you very well if you can't afford the jump to mechanical.



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.

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

AUDIO

PLANTRONICS GAMECOM 780

PRICE \$90

Solid set of cans with great audio. Also now available in DOTA and Counterstrike themes.



ONBOARD REALTEK ALC889A

PRICE NA

A decent chip that does the job.

POWER SUPPLY

SILVERSTONE STRIDER 500W

PRICE \$65

A solid PSU, capable of powering much more if you ever choose to upgrade.



SUBTOTAL: **\$4915**

RIG ONLY: **\$3750**

COOLER



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CASE



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SYSTEMDRIVES

OCZ REVO DRIVE 3 X2 & WD 1TB VELOCIRAPTOR

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MOUSE



RAZER OUROBORUS

PRICE \$135

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AUDIO

SHURE SRH-840

PRICE \$200

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POWER SUPPLY

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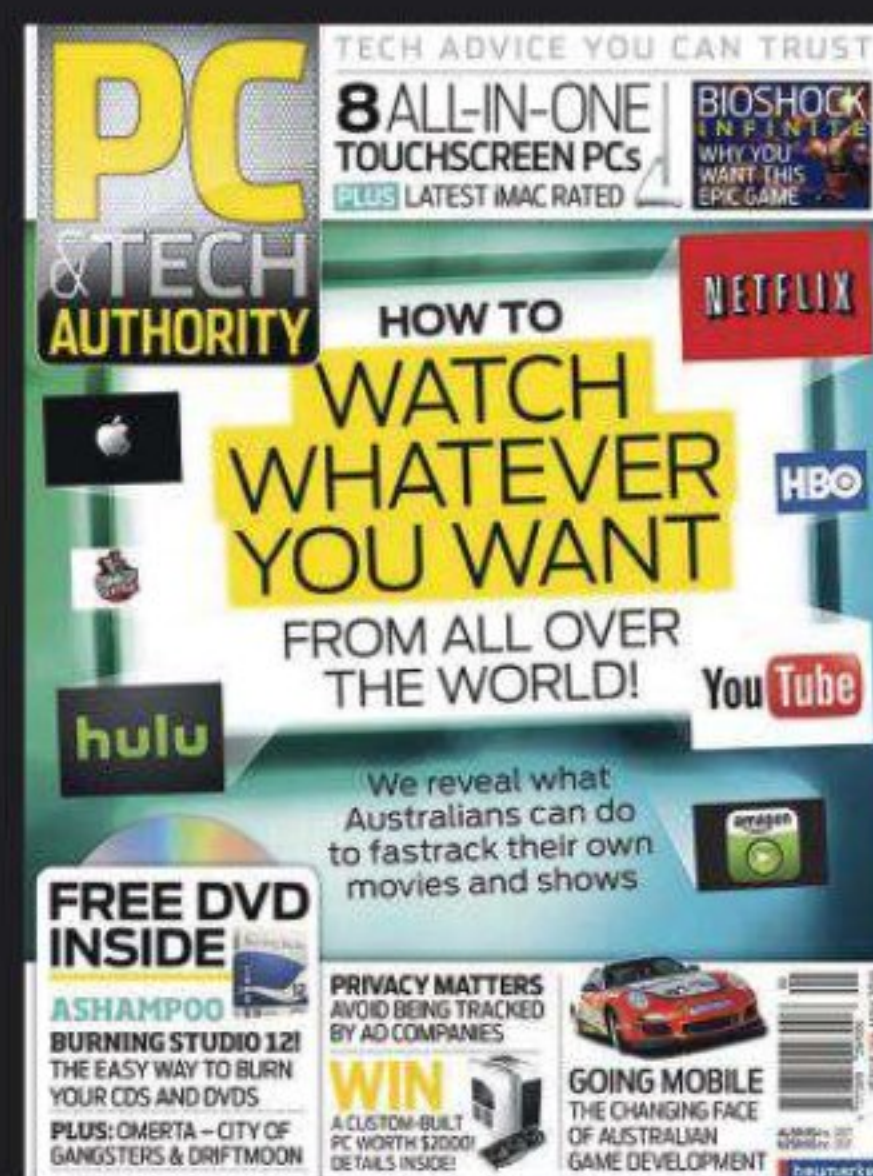
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QLD

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MSY	08 8212 1656
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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.

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HOW TO: Capturing The Flag: A Look At Session Hijacking

LUKE MILLANTA EXPLAINS A LITTLE-UNDERSTOOD FORM OF INTERNET DATA THEFT AND HOW TO AVOID IT

Session hijacking involves the theft of another's internet session, thereby allowing the attacker to impersonate the original user. Falling victim to a session hijacking attack could prove catastrophic because it may enable the attacker to perform any task that you, the victim, would be able to perform.

In this article I explain what session hijacking entails, and detail some of the more favoured methods for compromising a session token. I also discuss three of the tools most commonly used to perform such attacks and outline some prevention measures that you might implement, in either your home or place of business, in order to avoid becoming a victim of such an attack.

WHAT SESSION HIJACKING INVOLVES

At its most basic level, session hijacking involves the taking over of a victim's active internet session by covertly obtaining the victim's session token. Once the victim's session token has been accessed, the attacker can masquerade as the victim, and perform any tasks that the victim is authorized to perform.

The session token required to perform a hijack is normally stored within an internet cookie or URL. For most communications, authentication procedures are carried out at start up. The process of session hijacking takes advantage of this practice by intruding into the web session in real time. The ability to detect such an intrusion is dependent on both the technical knowledge of the victim and the specific nature of the attack.

ACTIVE AND PASSIVE ATTACKS

There are two broad forms of session hijack attacks which are known respectively as an active and a passive attack. An active attack involves the identification, attack, and successful takeover of an active internet session. It

is regarded as the more advanced form of attack, due to the higher level of skill which it entails.

A passive attack involves the attacker monitoring the traffic being sent across the victim's network and, as such, is nothing more than an advanced form of network sniffing. The attacker gathers information, such as login information, and then uses that information to authenticate in a separate session.

COMPROMISING SESSION TOKENS

Common methods employed in stealing a valid session token are: session sniffing; client-side attacks; man-in-the-middle attacks; and session prediction. Each of these is discussed below.

Session sniffing is the easiest approach to capturing a valid session token. It involves the monitoring of network traffic being sent between the victim's terminal and the server that the victim is connecting to. Monitoring this traffic allows the attacker to easily gather a wide range of sensitive data, including information regarding the session token as well as login details to various websites and services.

Another common means of gaining access to a session token, and other personal data, is for the attacker to use a client-side attack. One of the most common client-side attacks involves infecting the intended victim's terminal with a malware application, such as a

Trojan or Virus. This application then gives the attacker access to the target's data and allows the copying, editing and deletion of any file on the target's computer. The cross-site script (XSS) attack is another example of a client-

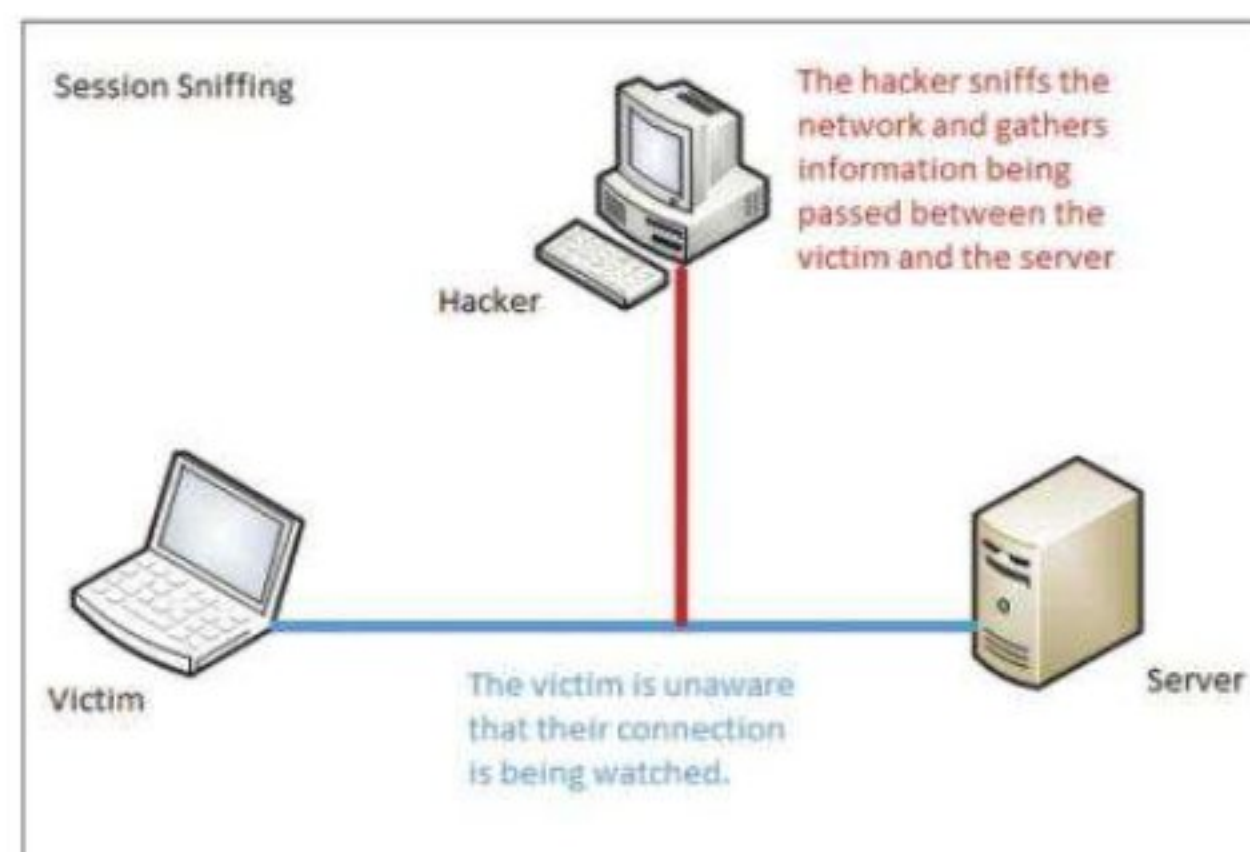
“One of the most common client-side attacks involves infecting the intended victim's terminal with malware...”

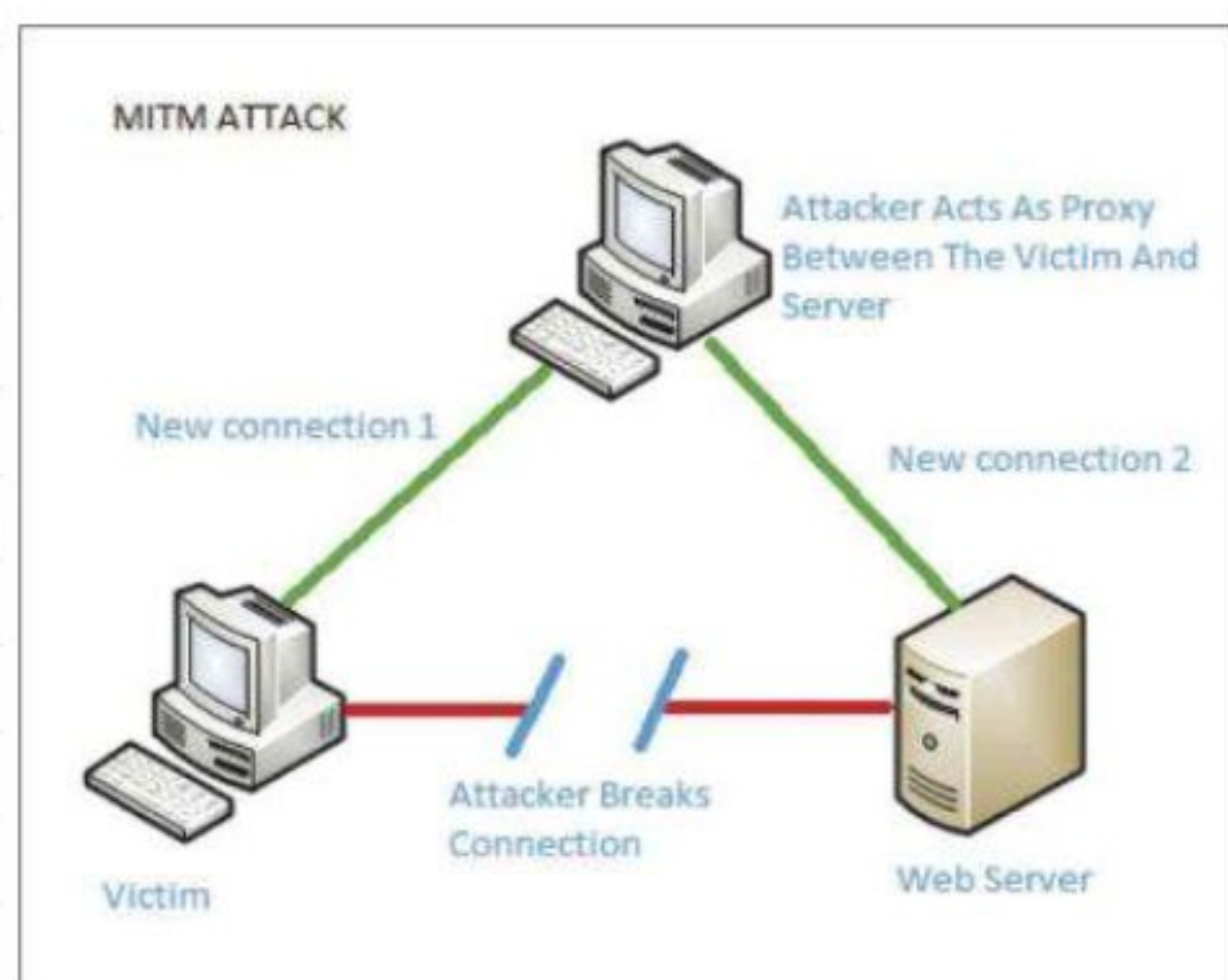
side attack. An XSS attack occurs when an attacker sends a URL containing malicious Javascript code to a potential victim. If the target navigates to the link, the malicious Javascript code will be executed, resulting in a copy of the target's session token being sent to the attacker.

A man-in-the-middle attack (MITM) occurs when the attacker intercepts communications between two systems, and then assumes the role of a proxy between both parties. The attacker does this by splitting the connection into two new links: one between the server and the attacker, and the other between the attacker and the victim. By acting as a proxy for all communications between the two parties, the attacker is able to read and modify the data that is sent between the victim and the server, including the session token.

A session prediction attack, which is, in my opinion, the most amateurish of attack methods, involves the attacker trying to guess the active session's token. The attacker does this by analysing both the means by which the session token is generated and the algorithms that are used to protect it. Once an attacker understands this process, they are able to predict a valid session token value and gain access to that session. Some simple, highly vulnerable session tokens may comprise predictable information such as timestamps and usernames. Employing such basic session token assignment schemes is extremely

▼ What session hijacking actually entails





dangerous and should be avoided!

▲ The anatomy of a Man-in-the-Middle attack

TOOLS EMPLOYED BY ATTACKERS

There are a variety of applications that can be used to sniff networks and hijack active sessions. Three of the most commonly employed applications are as follows.

Juggernaut is a network sniffer that was developed for Linux operating systems. Juggernaut allows the user to monitor all network traffic, or alternatively, to scan network traffic for specific keywords, such as usernames, website addresses or passwords. Juggernaut also allows the user to view information regarding all active network sessions, and provides the user with the option of hijacking any of these sessions. Juggernaut is a free-to-use application and installation guides are available on a variety of websites; a basic Google search should be sufficient to find one of these guides.

A second application is **T-Sight**, which is a network scanning and session hijacking tool designed for use within the Microsoft Windows environment. T-Sight allows the user to monitor all data being passed over a network. When a session id has been captured, a single button click allows

the attacker to hijack the session. In an attempt to prevent T-Sight being used for illegal purposes, Engarde, the company that produces and distributes T-Sight, only licenses the software to pre-determined IP addresses.

Finally, **Ettercap** is a free and open source network security tool that allows the user to perform man-in-the-middle attacks over Local Area Networks (LANs). Ettercap is compatible with a range of operating systems, including Linux, Mac OS X, Solaris and Microsoft Windows. It was ranked number 11 on the Top 100 Network Security Tools list of 2006. Ettercap is one of the most advanced sniffing tools available. It allows the attacker to analyse traffic using a variety of different methods, and enables the efficient location of information in the shortest possible timeframe. While Ettercap is arguably the most advanced of the three applications I have outlined, there are some known issues with its stability when operating within a Windows environment. However, it operates perfectly in Kali, a Linux distribution designed for penetration testers.

PREVENTING AN ATTACK

The following preventative measures can be taken to minimise the risk of being subjected to a session hijacking attack.

ENCRYPTION

The encryption of data, including the session token, passing between both parties can significantly reduce the chances of a successful session hijack attack. Encryption can be employed using a cryptographic protocol such as Transport Layer Security (TLS) or Secure Sockets Layer (SSL). Encryption is heavily relied upon by most web-based banking applications and e-commerce services, including eBay and Freelancer. A relatively effortless means of employing encryption is to

“T-Sight allows the user to monitor all traffic on a network.”

download and install the browser add-on, HTTPS Everywhere. This is the same software that is used by the Tor Project to enforce browser encryption within the Tor network. It should be noted that while encryption will dramatically reduce the effectiveness of sniffing-style attacks, there is still the potential for a session hijack to occur if the attacker uses a different method to gain access to the session token.

CONNECTIONS

Another way to mitigate the risk of having your session hijacked is to limit the number of remote connections to your network. This can be done by using a Virtual Private Network (VPN) server. This enables authorised users to connect to your network from an offsite location. Employing a VPN server adds an extra layer of protection between users and your network. When combined with SSL encryption, a VPN server, acting as a middleman between your users' personal terminals and your network, should offer sufficient protection against session hijacks in the majority of cases.

ANTI-VIRUS SOFTWARE

Making sure that up-to-date anti-virus software is installed on networked computers will help prevent the network being infected by malware. As discussed, malware can be used by an attacker to steal a session token.

EMPLOYEE EDUCATION

Educating employees as to procedures for safe internet use can be boring but nonetheless highly effective in preventing a range of attacks. Educating your employees about the different types of malware, how malware is spread (spam email, infected files etc.) and proper browsing habits, will assist in preventing infections that could spread across your network and reap havoc.

CONCLUSION

Whether you are operating on your personal, home, or business network, the threat of session hijacking attacks is very real. While a successful attack can be devastating to you and your business, the measures outlined in this article can assist in reducing the likelihood of an attack being effective. ■





SYSTEM BUILDER:

Next Generation consoles and the future of the desktop PC

FOR ALL THE TALK OF A DECLINING PC MARKET, **JOHN GILLOOLY** FINDS THAT THE FUTURE IS ACTUALLY LOOKING QUITE STRONG FOR THE DESKTOP PC AND THOSE THAT LOVE THEIR COMPONENTS.

This year's E3 exhibition featured a hefty focus on the Xbox One and PlayStation 4. These consoles are set to launch sometime in November this year, setting up this Christmas as one dominated by these new living room devices.

Much has been made of the marketing battle waged during E3, where many attendees and internet-based types declared that Sony was the victor. Sony managed to win the all-important hearts and minds battle for the next generation with clear messaging and a product that delivered a whole raft of things that console gamers were asking for.

In many ways, however, Sony announced a product that looks like an unambitious continuation of what it already has in the form of the PlayStation 4. It will have hefty online integration, yet this won't be compulsory. It will continue to focus on disk-based game distribution, with a business model that apes the current retail one. And it eschews any attempts at evolving beyond the controller in order to keep pricing low.

Microsoft, on the other hand, screwed up its marketing spectacularly. It just hasn't managed to get its message across to its target audience, and that has, in turn, led to a backlash from a lot of the console gaming community. In many ways the Xbox One is the only truly next generation product of the two consoles, with some ambitious features designed to push its technology forward, and cater for consumer behaviour over the next decade.

This involves leveraging key technologies that used to just

belong in the enterprise space from the company. The unit itself is built around Microsoft's Hyper-V virtualisation technology and it leverages the Azure cloud platform (and is the driver behind a massive expansion in the number of Azure

"The stark reality is that, for the PC, games make up the vast majority of the market."

servers deployed worldwide) in several unique ways.

However, it also has some requirements that have traditional console gamers up in arms. It needs to check in with the Azure servers once a day in order to keep games operational and it won't even boot without Microsoft's Kinect 2.0 camera

▼ Sony has easily won the PR war, but is it really the best next-gen console?

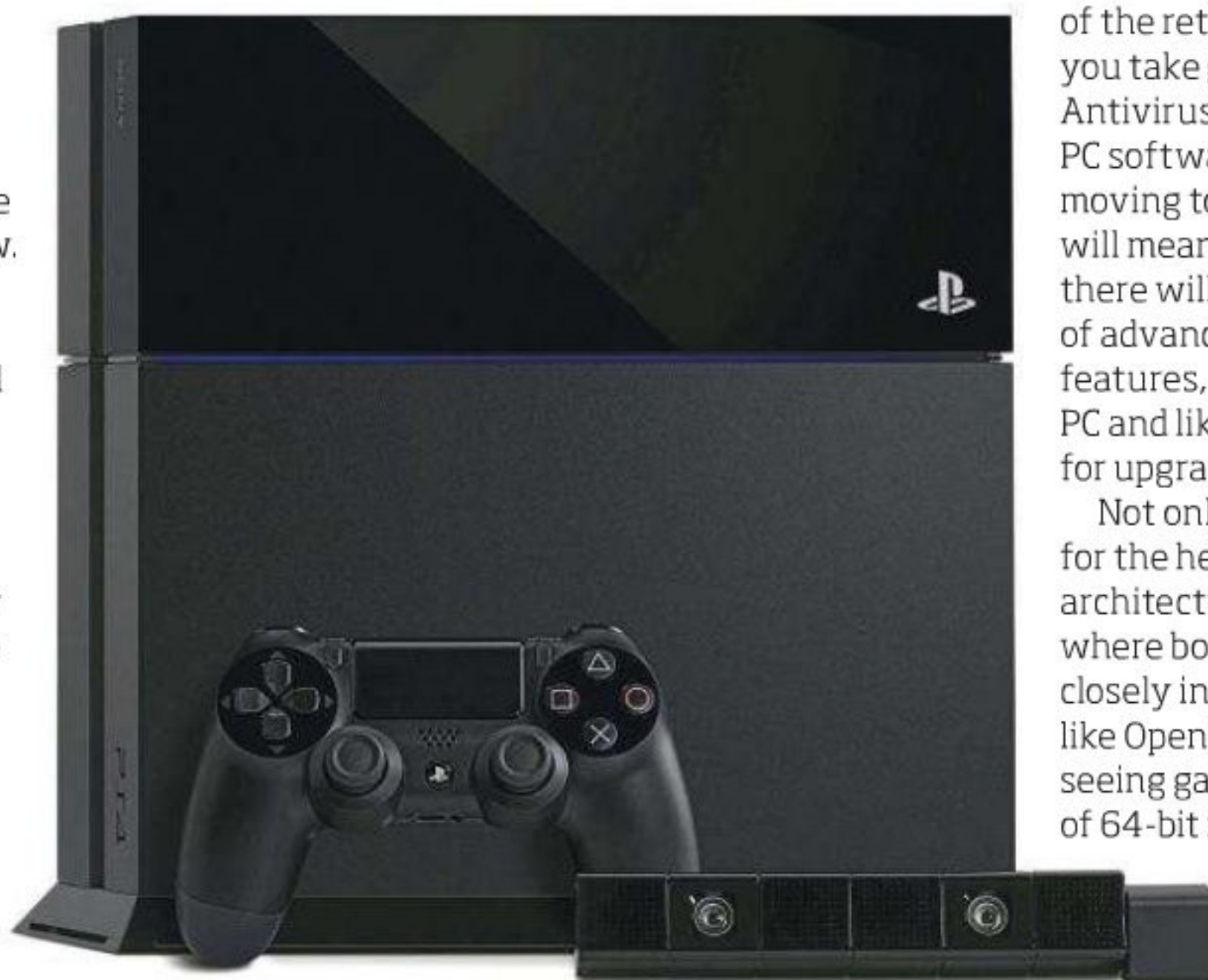
attached. In many ways Microsoft's failure at E3 comes down to it just not explaining these technologies properly, nor demonstrating just how these requirements will make the console gaming experience better.

But why even talk about these consoles in a section devoted to the joy of building one's own PC? The first reason is that new consoles will have a marked effect on the PC for a variety of reasons. Not only do they have a heavy influence on the AAA gaming market, but they will provide serious competition for the PC in the living room environment. They are also going to have an impact on software development, as both the PS4 and Xbox One use x86 based AMD APUs, making them much more PC-like than the previous generation of products.

The stark reality is that, for the PC, games make up the vast majority of the retail software market. Once you take games, Microsoft Office and Antivirus into account, the actual PC software market is tiny. Consoles moving to an x86-based architecture will mean that for the first time there will be widespread leveraging of advanced hardware and software features, and this will flow into the PC and likely become a major driver for upgrading systems.

Not only will developers be coding for the heterogeneous compute architecture that is pushed by AMD, where both CPU and GPU are more closely integrated through languages like OpenCL, but we will finally start seeing games take proper advantage of 64-bit instructions. That means

higher system and graphics memory capacities will become



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more than just a novelty, and that multithreaded workloads will get more sophisticated.

It could also be the boost AMD needs to regain relevance on the desktop. Both consoles use custom variants of AMD's jaguar cores, which are built around the modular design first launched with Bulldozer. In order to make the most from this architecture, software should be produced in a way that spreads the processing load out across modules. This alone should see AMD close some of the gap opened up by Intel's relentless execution of Moore's Law.

Despite the fact that the next generation of consoles will be the most PC-like to date, they are unlikely to have any major impact on the growing number of PC gamers. If anything, these units are testament to the way in which PC gaming has clawed back from the brink of piracy-driven oblivion over the past decade, with Microsoft's business model being remarkably similar to Valve's Steam and terms like 'persistent online worlds' and 'Free-to-Play' being bandied around by both companies.

This constant evolution of technologies and business models works heavily in the PC's favour. In many ways the PC has already moved on from what is being incorporated into the new consoles, and some of the most exciting new developments in gaming are happening first and foremost on the PC.

"Thanks largely to gaming, we are seeing more and more people coming back to the PC."

In our minds the biggest of these, and the most exciting product that we've seen in years, is the Oculus Rift. This is shaping up to be the first product that brings the promise of Virtual Reality to the masses, a stereoscopic 3D headset that takes you into the game itself. We've been playing with our developer version of the Rift for some months now, and while it clearly has some issues that need to be worked out, the sense of immersion and genuinely unique nature of the product is clear. Slipping on the Rift is the closest thing to entering a virtual world that we

► Microsoft's terrible messaging has obscured what is a very interesting product



have ever encountered, and it is an experience that will be focused on the PC for some time to come.

While the Rift is the true standout product in PC gaming's future, the other thing that we are excited about is streaming within the home. Companies like Nvidia, with its Shield handheld, and Valve with Steam Big Picture mode, are making serious moves to turn a single gaming PC into a powerful hub for gaming in the home. Being able to leverage one's home network to game on the desktop or the television makes for a much more compelling experience than just plugging a console into the TV.

Perhaps the most telling indication of the future of the desktop came from our time at Computex, stalking the show floor and talking with representatives of a myriad component and system manufacturers. Those making laptops and all-in-one systems were on the whole a lot less confident than those making components for the DIY market.

Our take away from the show was that, while the mainstream laptop market is being hit heavily by tablets and smartphones, the enthusiast PC market is still going strong, especially for those companies who haven't overreached in recent years. Some companies are struggling, especially those making SSDs, largely because they haven't really accounted for the fact that massive growth is coming to an end, and that the huge uptake in SSDs over recent years will naturally

slow down now that end users have upgraded.

Thanks largely to gaming, we are seeing more and more people getting back to the PC. This has led to a lot of new systems being built, and while they may not be bleeding edge beasts, they are helping to keep the component manufacturers afloat. What we expect to see over the next year and a half is continued growth in this space, as the second wave of cross-platform titles finally put stress on PC hardware that has been "good enough" for many years now.

For the end user this means that there will be some upgrading in the future, although it is unlikely to mean you'll need to junk your current system entirely. We'd expect more demands being made on memory and graphics cards, but these demands won't be the same as they were in the past. In many ways the need for speed will give way to the need for capacity - we'll start seeing more benefits from memory capacity and bandwidth on GPUs, rather than raw processing grunt which is already well ahead of what is going into the next-gen consoles.

Add to this the fact that 2014 is the year in which Microsoft will finally end support for Windows XP, and it is shaping up to be a big year for the DIY PC market. As laptop makers continue to throw everything at the wall and hope that something sticks, the desktop is set for a much more rosy future.

Watch this space. ■



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HOW TO: Perfect PC settings

DARIEN GRAHAM-SMITH GUIDES YOU THROUGH THE SETTINGS AND TWEAKS YOU NEED TO GET WINDOWS WORKING JUST THE WAY YOU WANT

Windows offers hundreds of configurable settings to serve your preferred way of working - not all of which are obvious or easy to find. There are plenty of unofficial improvements you can make, too, through Registry tweaks or small third-party tools.

We've rounded up more than 30 of our favourite lesser-known settings and simple tweaks that can turn a generic Windows system into your perfect PC. We've focused on Windows 7 and 8, with a section at the end specifically addressing new features in Microsoft's latest OS - but many of these adjustments also apply to older systems running XP and Vista.

DISPLAY SETTINGS

One of the most basic adjustments you can make to Windows is setting your own wallpaper and visual themes. The operating system comes with a few default themes, but in Windows 7 you can also access extra international

themes. Simply open Explorer and browse to the `C:\Windows\Globalization\MCT` folder to find them. In here you'll find a selection of folders: go into each in turn, then double-click on the Theme file contained within each one's Theme subfolder to add it to your Personalisation options. You can also download additional themes for free, in both Windows 7 and 8: open the Personalisation window and click the "Get more themes online" link to visit Microsoft's Themes archive, which offers hundreds of colourful, attractive options (and some pretty tasteless ones too, if that's what you're into).

The next thing to tackle is correcting Windows' colour settings - a quick tweak that can dramatically improve the contrast and cleanness of your display. To find the requisite tool, search for "Calibrate display colour". You'll be guided through a brief process of setting gamma (that is, making midtones darker or

There are hundreds of free Themes available to help get Windows looking exactly as you like

"You should end up with something that looks better to you than the default settings"

lighter), brightness, contrast and colour balance settings. This process doesn't really "calibrate" your monitor to any particular standard - that would need external hardware, to objectively measure the light coming from your screen. However, you'll end up with something that looks better to you than the default settings. Most graphics drivers include their own hardware-specific colour-correction tools, so if you can't get a satisfactory result with Windows' settings, look into your drivers for alternative controls.

After you've calibrated your display colour, you'll be invited to tune your ClearType settings. ClearType is Microsoft's subpixel anti-aliasing technology, which aims to make text on the screen appear as clean and smooth as possible. Driving a display at the subpixel level isn't an exact science, yielding different results on different monitors, so tweaking the settings can improve the clarity of text on your particular screen. Tuning ClearType involves simply viewing a selection of text samples with different smoothing settings applied and telling Windows which one to use - that is, the one that looks the most solid and smooth to you. You can re-run the tuning tool at any time by searching for "Adjust ClearType text".

As high-density screens become more common, a visual adjustment that can actually make Windows easier to use is increasing the size of text and icons. To access these settings, open the Screen Resolution window (right-click on the desktop and select Screen Resolution), then follow the link named "Make text and other items larger or smaller". On Windows 7, you'll see options to adjust

The screenshot shows the Windows 7 Themes website. At the top, there's a navigation bar with links like "MEET WINDOWS", "DOWNLOAD & SHOP", "HOW-TO", and "SUPPORT". Below this, a "Themes" section is highlighted. The main content area displays a grid of theme thumbnails. On the left, a sidebar lists various theme categories such as "Animals", "Art (illustrative)", "Automotive", "Games", "Holidays & seasons", "Movies", "Natural wonders", "Places & landscapes", "Plants & flowers", "Branded themes", "From the community", "RSS dynamic themes", and "Panoramic". The main grid shows six theme cards, each with a preview image, a title, the number of images in the theme, a window color swatch, and buttons for "Details" and "Download". The themes shown are: 26Creative (4 images), Abstract Bright (7 images), Abstract Dark (10 images), African Wildlife (14 images), Age of Empires Online (14 images), and Akrapovic (10 images).

the scaling of icons, text and other interface elements to more than 100% of the default size. On Windows 8, you can apply finer control via a dropdown menu at the bottom of the window that lets you set individual font sizes for various elements. You can also independently adjust the size of desktop icons – and leave everything else the same – by right-clicking on the desktop and selecting Large, Medium or Small icons from the View context menu. For finer control, click on the desktop, then hold down Ctrl and scroll with your mouse wheel to gradually increase or decrease the size of your icons.

It's also possible to resize the taskbar: start by right-clicking on it and ensuring that "Lock the taskbar" is unticked. Once it is, you can drag the top edge of the taskbar up and down to change its size. Sadly, your icons don't scale to fit, so if you want a larger taskbar the effect can be quite ugly; if you want a smaller one, though, you can make Windows show smaller icons by right-clicking on the taskbar, selecting Properties, then ticking "Use small taskbar buttons" in the Settings window that opens.

You'll see numerous other options here, too, that allow you to customise the taskbar in other ways, including moving it to a different edge of the screen, setting it to hide automatically when it isn't needed, showing a separate icon for each application window and, on Windows 8, managing how taskbar buttons should behave on secondary displays.

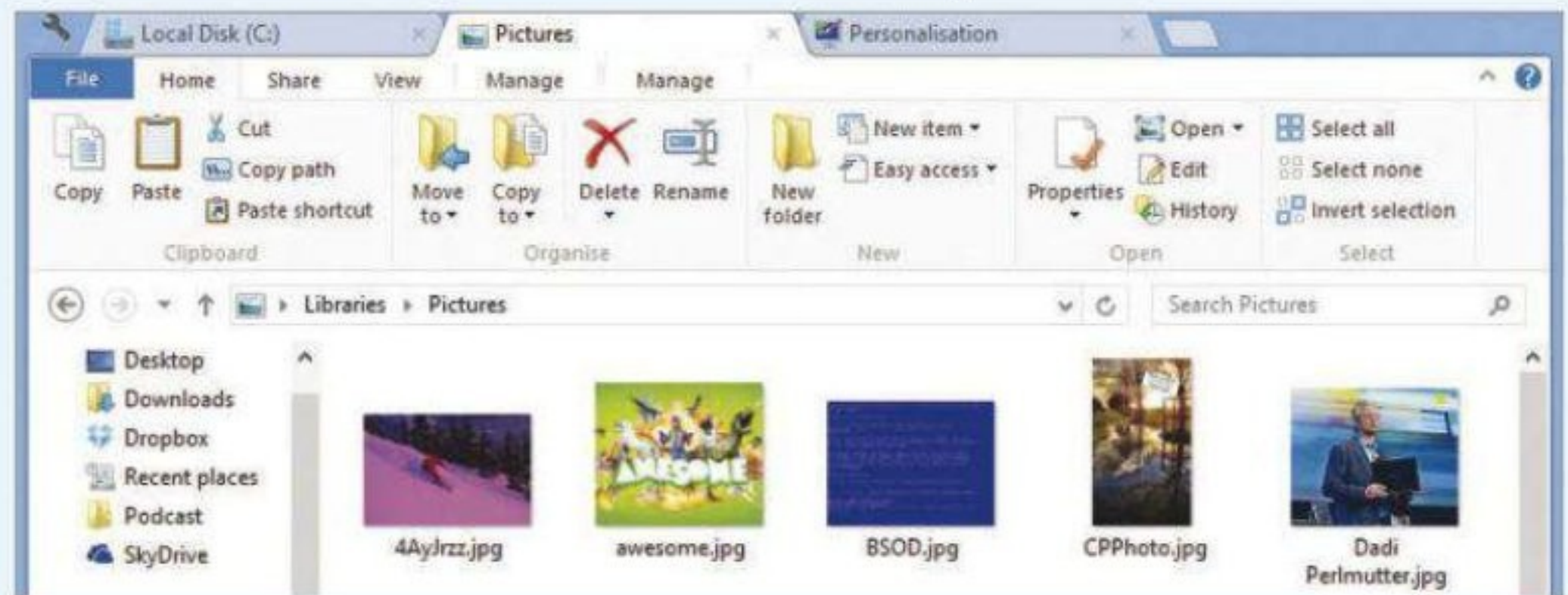
EXPLORER SETTINGS

Some of us spend a lot of time in Explorer, so it's worth customising it to suit the way you work. The first thing we recommend is that you adjust folder view settings so that filename extensions and hidden files are shown. This removes uncertainty when you're trying to identify the right file,

ADD TABS TO WINDOWS EXPLORER

Once you start copying files back and forth in Windows, things can get messy, with dozens of Explorer windows cluttering your desktop. Wouldn't it be neater if you could open folders in different tabs, just like pages in a browser? You can do it with a free tool called Clover,

which even uses the familiar Ctrl+T and Ctrl+W shortcuts to open and close tabs. It's free, third-party software, so you might come across the odd bug, but for the most part it works smoothly. Download it from <http://ejie.me> and give it a try (don't be put off by the Chinese text at the website – click "English" for a page you can read).



or work out where your disk space has gone. It's also a positive step for security: malware creators have been known to disguise their malicious files as harmless Word documents by using a misleading icon and relying on Windows' default settings to hide the real filename extension.

“Some of us spend a lot of time in Explorer, so it's worth customising it”

You can change these settings via Windows' Folder and Search options. In Windows 7 these are found under the Organize dropdown in Explorer; in Windows 8, click the Options button at the end of the View section of the ribbon. These settings are found under the View tab of the Folder Options window, along with numerous other options for further customising the way Explorer displays files.

Under the General tab of that same requester, you'll find two more useful settings: the bottom section offers tickboxes that change navigation pane settings. If you tick "Show all folders", your personal folder, the control panel and the Recycle Bin will become visible in the folder tree at the left-hand side of Explorer windows. Tick "Automatically expand to current folder", and Windows will show a fully expanded view of your folder path – eating up much more vertical space, but potentially making it easier to find your way around.

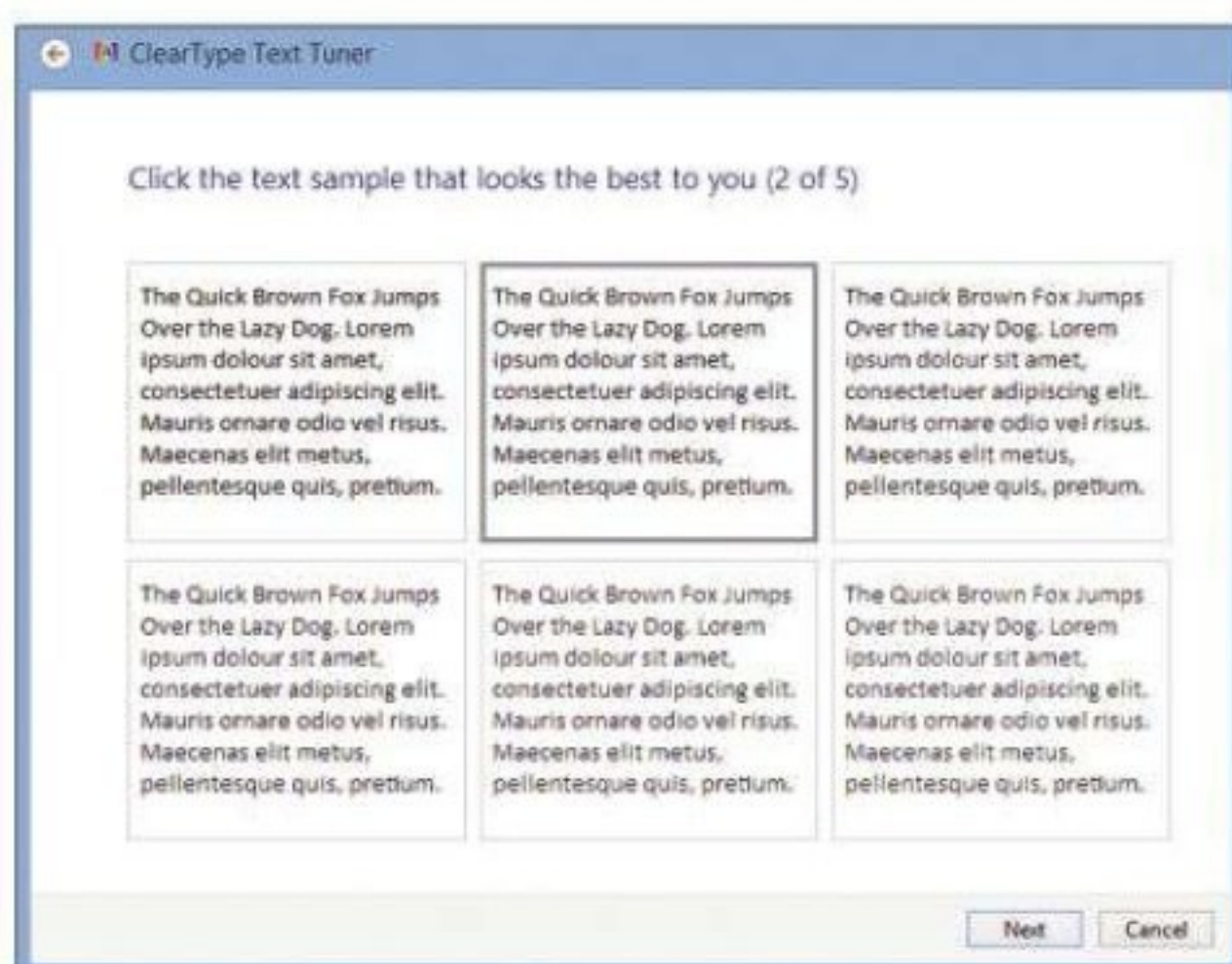
Another time-saving tweak is to change Explorer's default directory – that is, the folder that opens up when

you launch a new Explorer instance. By default, the Explorer icon on the taskbar opens up on a view of your Libraries. To change this default folder, right-click on the icon; then right-click on Windows Explorer (Windows 7) or File Explorer (Windows 8) and select Properties. Replace the file path in the Target field with your desired path – for example, enter %userprofile%\Documents to make Explorer open at your Documents folder. If you want to start in the Computer view, enter shell:MyComputerFolder. Sadly, it seems there's no built-in way to change the default folder that opens when you use the Windows+E keyboard shortcut to open a new Explorer window: to change this, you'll have to use a third-party keyboard tool such as the free AutoHotkey (www.autohotkey.com).

If you want to add a command prompt item to the default Explorer context menu, there's no need to tweak anything: simply hold down Shift while you right-click on a folder and you'll see the menu appear showing the (ordinarily hidden) "Open command window here" option. With a little tweaking, it's also possible to add other useful items: for example, you can add "Copy to" and "Move to" context menu items to Windows 7 by adding a few Registry settings. You can download a ZIP file containing the relevant Registry files (and some others, which we'll address below) from <http://tinyurl.com/lqmt3vs>.

This isn't necessary for Windows 8, as dropdowns for "Move to" and "Copy to" are already present on the Explorer ribbon, under the Home tab. However, you may also find it useful

▼ Tweaking font-smoothing settings can give you sharper, clearer text



to add a Take Ownership context menu item: you'll find the requisite Registry files in the ZIP file referred to above. This works on both Windows 7 and Windows 8.

If you frequently find yourself deleting unneeded files, you can streamline things by disabling delete confirmations: right-click on the Recycle Bin and select Properties to open the relevant dialog, and untick the box at the bottom. From here you can also set a maximum size for the Recycle Bin - potentially useful if you have limited disk space and don't want it clogged up with discarded files. Alternatively, you can disable the Recycle Bin and have files permanently removed as soon as you hit delete. For obvious reasons, use these settings with care!

You can also create a shortcut to the Recycle Bin. Right-clicking on the icon and selecting Create Shortcut will create a shortcut that you can put in a folder or in your Favourites bar. If you want to pin the Recycle Bin to the taskbar, you'll find this shortcut won't go there, but you can easily create one that will. Right-click on the desktop, select New | Shortcut, then enter "%SystemRoot%\explorer.exe shell:RecycleBinFolder" as the target location. This shortcut will be pinnable, but it will have an Explorer icon rather than a Recycle Bin one. To fix this, right-click on the icon, open the Properties dialog, switch to the Shortcut tab, click Change Icon and select a more appropriate icon. If you don't like the XP-style one that's offered, click Browse and select C:\Windows\System32\Shell32.dll for a wider selection, including the regular Windows 7 or 8 icon.

Users of Windows 8 in particular might also like to create a Shutdown shortcut. Simply create a new shortcut as above, then enter "shutdown /s /t 0" as the target: this will shut down the PC right away. By setting different flags you can make the PC reboot, hibernate, log off or do various other things: open a command prompt and type "shutdown /?" to see a full list. Once you've made your shortcut, you can edit its icon and pin it to the taskbar or Start screen as you wish.

STARTUP SETTINGS

Although not directly a Windows tweak, it's sometimes worth tweaking BIOS settings for a faster, cleaner startup. BIOS menus often let you choose between fast and slow self-initialisation and memory-testing: a faster self-test will be less thorough, but if you're not experiencing any

GIVE WINDOWS A NEW LOOK

If you're looking for a completely new feel to Windows, check out WindowBlinds - a tool that makes it easy to completely re-skin Windows, with new fonts, icons, colour schemes and more. It costs \$US20, and it isn't currently compatible with Windows 8,

but for anyone using an earlier edition of Windows it's a fun way to take charge of the appearance of your OS. You can choose from the numerous included themes, or customise your own. Find out more at www.stardock.com/products/windowblinds.



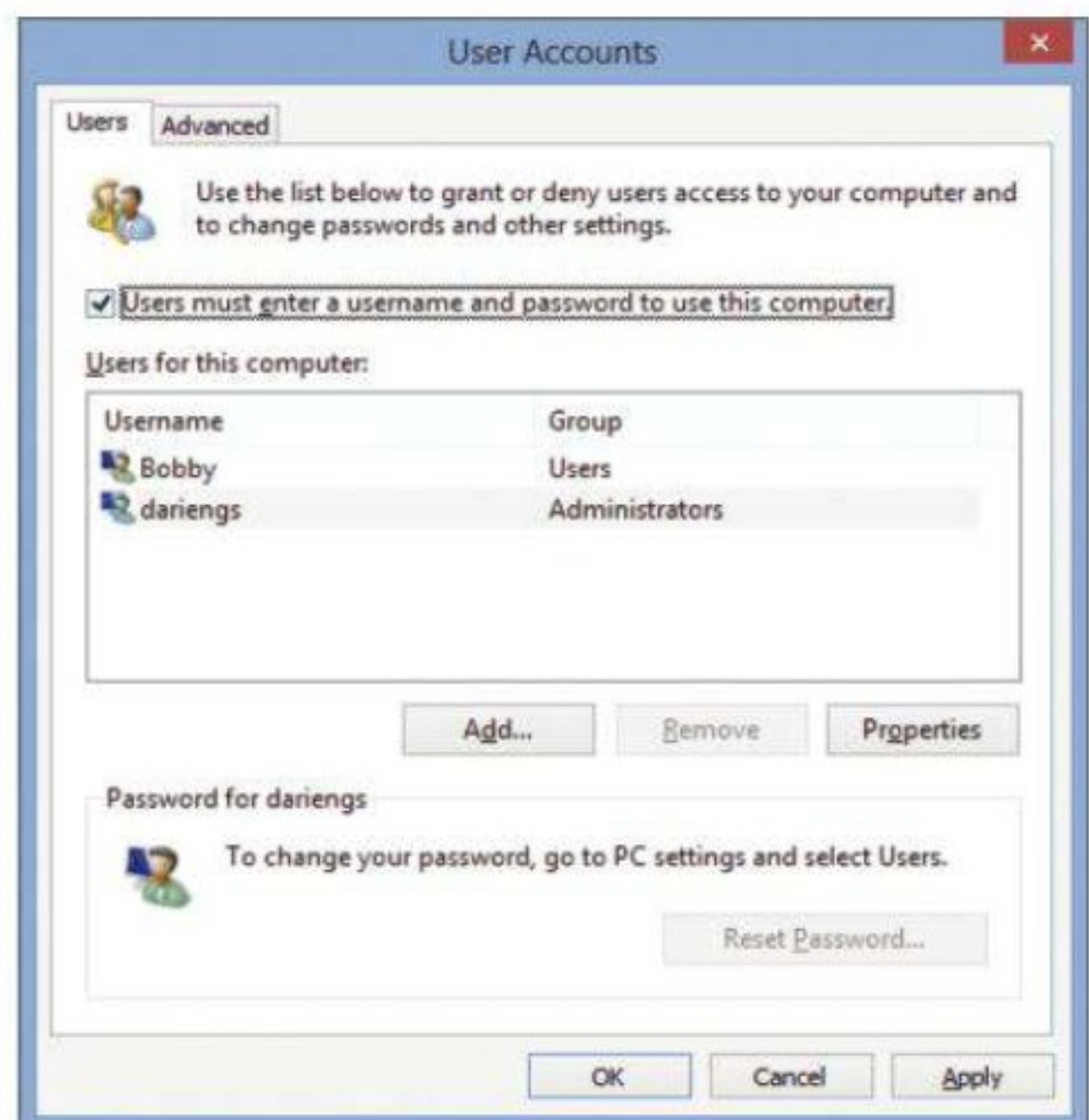
problems then a quick test is normally all you need. You can often disable startup splashscreens too, in favour of potentially more useful diagnostics information. It may also be possible to tweak other settings, such as whether Num Lock and Fn-lock are enabled or disabled at startup.

Once Windows boots, you can set it to log in automatically so that you don't need to type a password. Obviously, you shouldn't do this on a work laptop that stores confidential information, but it can be convenient for a home PC. Search for "netplwiz", or, if that doesn't work, type "control userpasswords". In the dialog that opens, select the user you want to be automatically logged on, then untick "Users must enter a user name and password to use this computer". Click Apply and you'll be prompted to provide your username and password one last time. The next time you start up Windows you'll be automatically logged on.

If you're using Windows 8, you might also want to disable the lockscreen that pops up when you wake the computer from sleep. To do this, type "gpedit.msc" to launch the Group Policy Editor, then navigate to Computer Configuration | Administrative Templates | Control Panel | Personalization. Double-click on "Do not display the lock screen" and select Enabled to activate the setting.

▶ A hidden dialog lets you configure Windows to log you on automatically, without the need for a password

Another useful option in the Group Policy Editor - albeit one that's more to do with shutting down than starting up - is one that will disable automatic restarts for Windows Update. To find it, navigate to Computer Configuration | Administrative Templates | Windows Components | Windows Update and set "No auto-restart with logged on users for scheduled automatic updates installations" to Enabled. This works in both Windows 7 and 8, although not all editions of Windows 7 include the Group Policy Editor. If you don't have



the tool, you can use a Registry tweak to set the policy – this is also included in our pack of Registry tweaks at <http://tinyurl.com/lqmt3vs>.

If you want to set windows and applications to open automatically with Windows, the decades-old technique of dragging shortcuts into the Startup folder still works in both Windows 7 and 8 (even though it isn't clearly exposed in either). You can find the Startup folder inside your personal profile folder, under AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup (or Start-up on Windows 8). You can also use the Startup folder in the All Users profile directory to set auto-start items for everyone who logs on. Note that in Windows 8, applications don't launch immediately at login, but when you open the desktop for the first time in a session.

Conversely, to keep your PC running quickly and smoothly, you may want to prevent items from opening automatically with Windows. On Windows 7 you can achieve this using the `msconfig.exe` file (simply

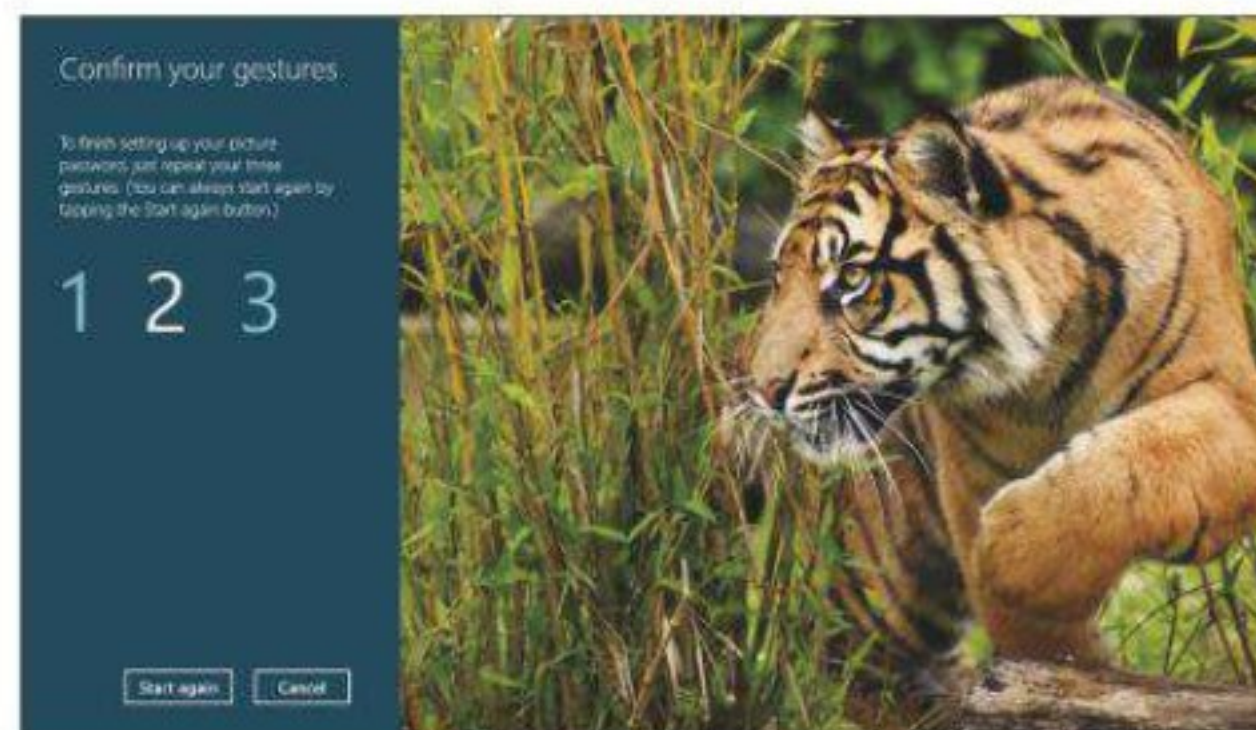
“The latest version of Windows brings plenty of new settings to play with”

search for its name to launch it). Open the file, click the Startup tab and untick any items you don't wish to launch automatically. You may need to experiment to get the desired results, but it's normally safe to disable everything except services that need to run constantly in the background, such as security software components, synchronisation/backup tools and remote access services.

On Windows 8, startup management is moved into the Task Manager: press Ctrl+Shift+Esc to open it, click “More details” if it opens in its compact state, then click the Start-up tab to see all items that are set to run at startup, along with an estimate of the impact they have on boot time. Right-click and select Disable to stop them from loading.

WINDOWS 8 SETTINGS

The latest version of Windows brings plenty of new settings to play with. The first thing many people will want to do is bring back the desktop Start button. You can't do this directly within Windows, but free tools can replace it for you: one we've used with success is the open-source Classic Shell, which you can download for



▲ If you're on a touch device, it's easier to draw lines and circles than to enter a password

free from www.classicshell.net. This tool can also automatically open the desktop at startup, rather than leaving you staring at the Windows 8 Start screen. If you want to achieve that without a third-party tool, you can create a Scheduled Task that launches `C:\Windows\explorer.exe` every time you log on: see <http://tinyurl.com/m9u2fhy>.

Speaking of logging on, if you wish you can set a picture password or numeric PIN instead of a conventional password. You can't access these settings from the desktop, but if you open the settings search screen (by pressing Windows+W) and type “password”, you'll see the relevant options appear.

If you spend most of your time on the desktop, you may be frustrated by the way Windows 8 arrives with numerous file types set to open in full-screen apps, rather than in desktop applications. You can choose to open files on the desktop by default by opening the Default Programs dialog and clicking “Set your default programs”. In the window that opens, you'll see a set of installed applications. If you select Windows Media Player and click “Set this program as default”, music and video files will open in this application when double-clicked, rather than in Windows 8's Music and Video apps. Similarly, you may choose to set Windows Photo Viewer as your default image application, rather than the Photos app. For finer control, return to the main Default Programs dialog and click “Associate a file type or protocol

with a program”: this will let you specify default applications on a per-extension basis.

You can also customise the Windows+X menu, which offers direct shortcuts to various desktop-based features and settings. You can edit this menu by opening Explorer, navigating to your personal home directory, then clicking through to the folder `AppData\Local\Microsoft\Windows\WinX`. You'll find three subfolders, named Group 1, Group 2 and Group 3. Drop a shortcut into one of these folders and a link to it will appear at the top, middle or bottom of the menu. You can also remove the default menu items, or edit their shortcuts so as to – for example – change the default folder used by Explorer when you open it in this way.

If you have kids, you may wish to disable the Windows Store, to prevent anyone who uses your PC from buying new apps. This is another job for the Group Policy Editor, so type “`gpedit.msc`” to launch it, then browse to Computer Configuration | Administrative Templates | Windows Components | Store. You'll see a policy named “Turn off the Store application”: enable this and, next time you restart, the Store will be gone. The Windows Store is disabled by default on Windows To Go systems, but you can bring it back by enabling the policy named “Allow Store to install apps on Windows To Go workspaces”.

Lastly, if you use a lot of downloaded applications, you may find it convenient to disable SmartScreen – the security feature that, by default, prevents unrecognised software from running; it allows it to launch with administrator permission instead. This behaviour can be changed from the Action Center: search for **Action Center** by name, then open it and click the “Change Windows SmartScreen settings” link at the left-hand side of the window.

You can now choose to allow any user to install unrecognised software, or turn off the warnings altogether. ■

SWITCH BETWEEN VIRTUAL DESKTOPS

If you've used OS X, you may be familiar with its Spaces feature, which lets you switch back and forth between multiple virtual desktops on a single display. Windows doesn't natively support this type of desktop switching, but there are free tools that can add the capability. One option is the free, open-source VirtuaWin tool (<http://virtuawin.sourceforge.net>), which lets you

work with up to nine virtual desktops at once. Another alternative is Dexpot (<http://dexpot.de>), a commercial product that's free for personal use. You can set applications to open automatically in specified workspaces, and if you have multiple displays, you can optionally specify which screens you want to remain static – so you can always see your email, for example.

HOW TO: 24 top Microsoft PowerPoint tips



MAKING AND DELIVERING PRESENTATIONS NEEDN'T BE A SLOG. **DARIEN GRAHAM-SMITH** SHOWS YOU HOW TO GET THE MOST FROM POWERPOINT

Love it or hate it, PowerPoint is a ubiquitous business tool. It's also one of the easiest-to-use members of the Office family – it's perfectly possible to dive in and get professional-looking results with no formal training. This means its more advanced features can be easily overlooked.

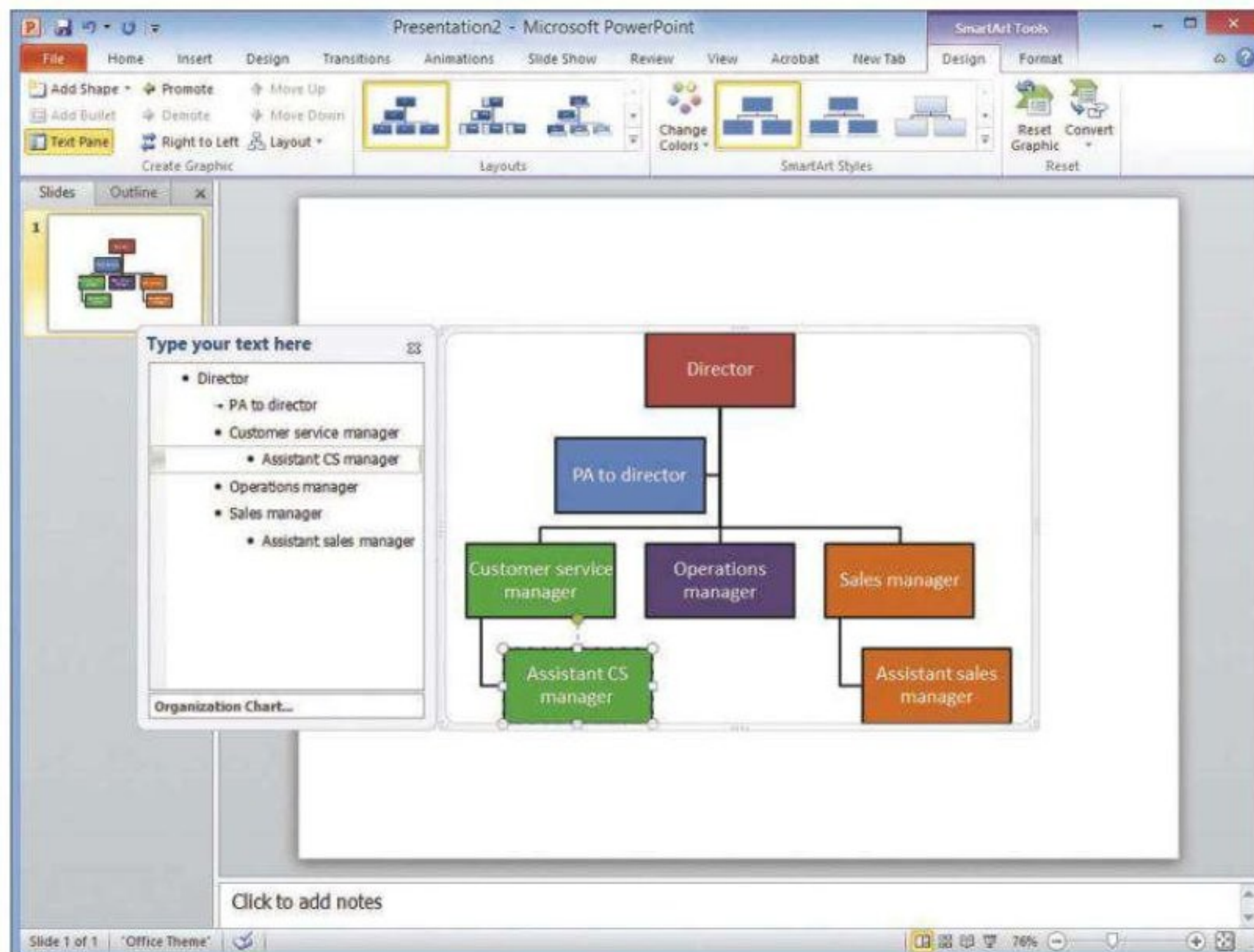
Here's a selection of our favourite tips and tricks for PowerPoint, covering everything from creating your presentation to saving, sharing and presenting it. Unless otherwise noted, these features are available in PowerPoint 2007 and later, and in many cases can be used in earlier versions, too.

CREATING THE PERFECT PRESENTATION USE SMARTART TO SHOW STRUCTURE

SmartArt can help you create visualisations of lists, processes, cycles, hierarchies, pyramids and more in only a few clicks. Click Insert | SmartArt and choose an appropriate design, then enter your text in the pop-up window at the left of your SmartArt object, using the Tab key to express hierarchies. You can adjust colour and formatting by right-clicking and using the contextual palette. PowerPoint 2010 and 2013 include SmartArt templates for working with graphical content as well as text.

USE SECTIONS TO KEEP EVERYTHING IN ORDER

PowerPoint's Slide Sorter view lets you re-order slides by dragging them around. In PowerPoint 2010 and 2013, you can organise your presentation on a larger scale by dividing it into sections: simply right-click in the Slide Sorter or Slide Pane view and select Add Section (selected slides are automatically moved to the new section). You can move sections around by dragging the section header, and apply design changes to



entire sections by clicking a header to select all the slides in that section.

PLACE ELEMENTS EXACTLY WHERE YOU WANT THEM

You can nudge elements into place using the cursor keys. If you hold down Ctrl while nudging, the element will move in much smaller steps, helping you position things precisely. Hold down Shift and tap the cursor keys to shrink or grow elements; hold down Alt and the cursor keys to rotate pictures and textboxes; hold down Ctrl at the same time to nudge the scale or rotation by smaller increments.

USE THE ANIMATION PAINTER

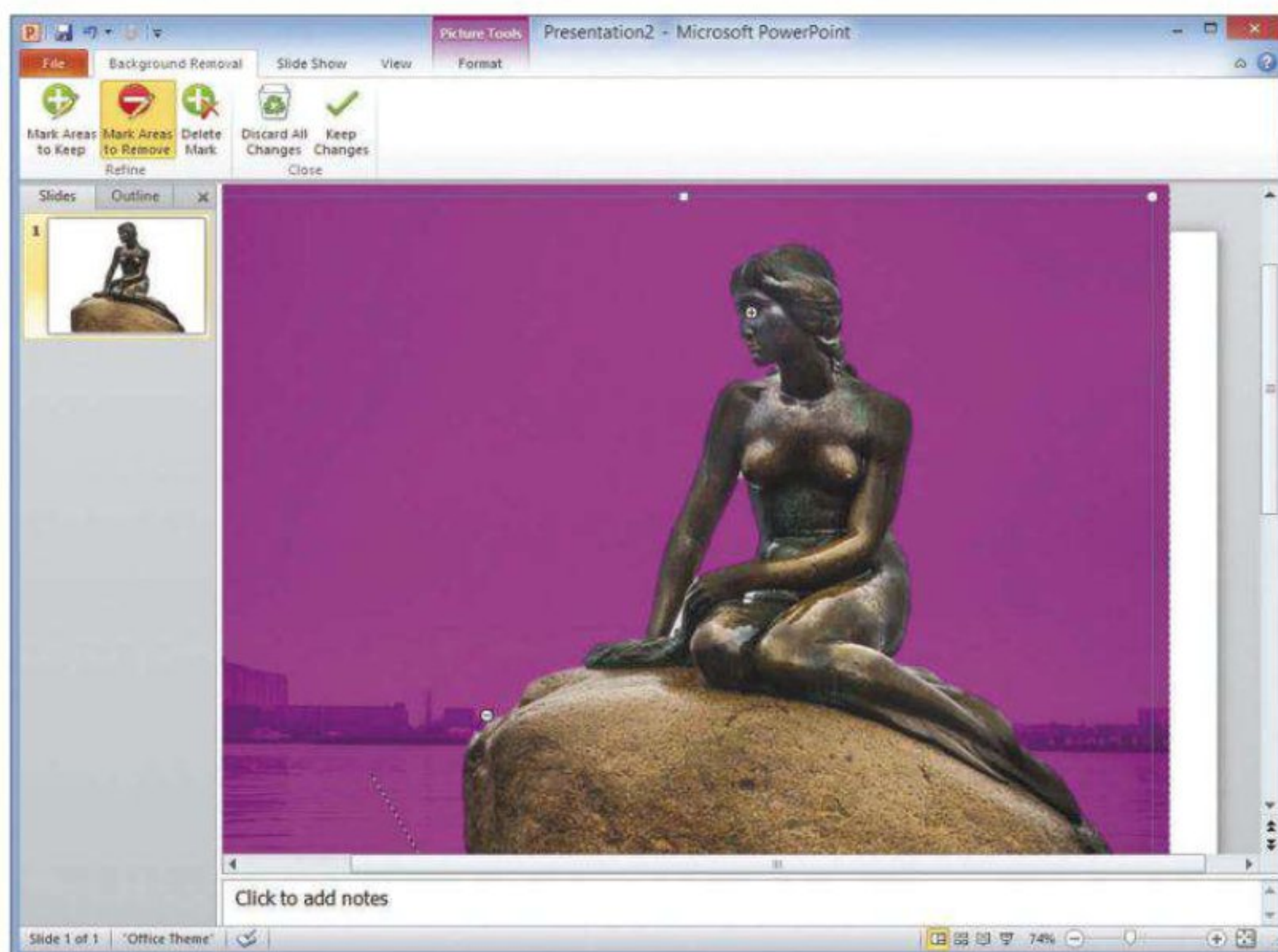
Animations are best used sparingly, and if you want to animate multiple elements in your presentation it's best to keep things consistent.

▲ SmartArt lets you quickly turn text and graphics into informative visual layouts

In PowerPoint 2010 or 2013, you can set up one element with your desired animation, then click on it, select Animation Painter (in the Advanced Animation section of the Animations tab) and click on a second element to apply the same animation settings. This works with all types of animations, including custom motion paths of your own choosing, and it also works with complex chains of effects.

ALIGN AND DISTRIBUTE

If you need to line up boxes and images neatly, simply select the elements you want to tidy up (use Shift+click or Ctrl+click to select multiple elements), then click the Arrange dropdown on the Home tab. Under the Align submenu, you'll find options to align the tops, middles or sides of all the selected objects. You can also distribute items horizontally or vertically to even out



the spacing between them.

GROUP OBJECTS

Grouping elements together lets you move, scale and format them as one. Simply select the elements you want to group, then right-click and select **Group | Group**. To select individual objects within a group, click on the group, then click again on the object. To dissolve a group, right-click and select **Group | Ungroup**; if you later want to recreate the group, right-click on any object that was part of the group and select **Group | Regroup**.

TIME-SAVING TOOLS EDIT IMAGES WITHIN POWERPOINT

Imported images can be resized and tidied up directly within PowerPoint 2010 or 2013. From the **Picture Tools | Format** tab (which appears when you select an image), you can crop out parts of a picture, adjust the brightness and contrast, tweak the colour tone and even apply artistic effects. You can also remove the background from an image: PowerPoint tries to guess which portions of the image should be removed, and, if it doesn't get it 100% correct, you can add marks to indicate which areas of the image should be cut away.

CUSTOMISE THE RIBBON

In PowerPoint 2010 and 2013, you can put your favourite commands on a custom ribbon tab for easy access.

Click on the **File** tab, select **Options** and go to the **Customize Ribbon** pane. From here you can use the **New Tab** and **New Group** buttons to set up your new tab, then drag your desired commands across from the left-hand column. To find commands that aren't normally exposed, select **"Commands Not in the Ribbon"** in the left-hand column.

▲ PowerPoint's built-in graphic-editing tools help you tidy up and customise the images in your presentation

“Under the Design tab, you'll find the Page Setup button that lets you specify the shape of your slides.”

INSERT DATE AND TIME

A simple tip, but a useful one: on the **Insert** tab, you'll see a button for **Date & Time**. This lets you include the date and time - either fixed or live - in the body or footer of your slides, and separately on notes and handouts.

USE CTRL+RETURN TO MOVE QUICKLY BETWEEN FIELDS AND SLIDES

Pressing **Ctrl+Return** while entering text moves your cursor into the next text field on the slide. If you're in the last field on the slide, this key combination inserts a new slide and places your cursor in the top text field. Using this method, you can set up the framework of a new presentation very quickly, with barely any need to touch the mouse.

USE GRIDS AND GUIDES TO HELP WITH POSITIONING

In the **Home** tab, click **Arrange | Align**; at the bottom of the menu that appears, you'll see an option for **Grid Settings**. The dialog that opens includes an option to snap objects to other objects, and also lets you display smart guides (dotted lines that show when the top, bottom, middle or side of an object is aligned with that of another object). You can also enable drawing guides, which show the horizontal and vertical mid-points of each slide. In PowerPoint 2013, these show when the spacing between objects is regular, too.

USE QUICK STYLES FOR A CONSISTENT LOOK

The **Quick Styles** dropdown lends a consistent character to panels and textboxes. Select the element you want to style and hover over the **Quick Style** options to see the effect. Each style is initially offered in a choice of seven colours, but you can use the **Shape Fill** tool to customise the colour of any styled element.

SAVING AND SHARING COMPRESS PICTURES

Before sending a large presentation by email or sharing it online, you may want to shrink it down. You can do this by clicking **Compress Pictures** under the **Picture Tools | Format** tab. The dialog lets you discard cropped areas of pictures, and reduce the pixel density to suit a variety of purposes. The maximum 220ppi setting may save the space you need, so try this before going lower.

EMBED FONTS

When you view your presentation on a client's PC, your chosen font might not be available - potentially throwing off the positioning of your text. To ensure this doesn't happen, go to **File | Options**, open the **Save** pane and tick **"Embed fonts in the file"**. It's best to embed all characters, even if you don't plan to edit the presentation: a typeface typically adds less than 100KB to the file, and this way you'll be able to make last-minute changes if need be.

CHOOSE THE RIGHT ASPECT RATIO

You may be designing your presentation on a widescreen monitor, but many projectors have a 4:3 aspect ratio. PowerPoint adapts slides to the shape of the display, but it's best to target the right aspect

ratio in the first place to ensure everything will appear in the right place. Under the Design tab, you'll find the Page Setup button that lets you specify the shape of your slides.

MAKE YOUR PRESENTATION PLAY AUTOMATICALLY

For a professional look, you can make your slideshow start automatically as soon as you double-click on its icon. To achieve this, save it in PowerPoint Show (PPSX) format rather than the default Presentation (PPTX) format. You can still edit a PPSX file in PowerPoint by opening it from the File | Open dialog or dragging its icon into the window.

“It can be useful to assign timings to your slides so they advance as you speak. If there's an interruption, simply tap S...”

CREATE A VIDEO OF YOUR PRESENTATION

Want to share or distribute your presentation in video form? This is easy in PowerPoint 2010 and 2013. Under the File tab, click Save & Send; under the File Types options, click Create a Video. You can set options for resolutions and timings, then click Create Video to output the file in WMV format. If you want your video to include narration, you can record it via the Insert | Audio dropdown.

▼ Presenter View lets you see an overview of your slideshow and notes while presenting

BROADCAST OVER THE WEB

You can easily embed a video in a web page, but if you want people to follow in real-time - perhaps on a live conference call - you can use the built-in Broadcast feature in PowerPoint 2010 and 2013. Click File | Save & Send, select Broadcast Slide Show and then click Start Broadcast. You'll be prompted to enter your Windows Live ID (your viewers will need ID s too), then a link to the broadcast will be generated. Share this with your audience however you wish and, once everyone's logged in, click Start Slide Show to begin stepping through your slides.

GOING LIVE BLANK THE SCREEN DURING PAUSES

If you need to take a break while presenting your slideshow, tap W to temporarily turn the screen white, or B to turn it black; pressing any key or clicking the mouse will resume your slideshow. You can also use the comma and full-stop keys to the same effect. To hide the mouse pointer, press A; it will reappear when you click, or when you move the mouse more than a certain distance.

DRAW ON YOUR SLIDES

Press Ctrl+P while in Presentation mode and your mouse pointer will turn into a drawing cursor, which you can use to sketch annotations on top of your slides. Ctrl+E switches to Eraser mode, while Ctrl+A switches you back to the regular mouse pointer. When your presentation is over, you'll be given

the option of keeping or discarding your annotations, which can be very handy for any educational presentations.

USE YOUR MOUSE AS A LASER POINTER

In PowerPoint 2010 and 2013, if you want to draw attention to a particular part of a slide, all you need to do is hold down Ctrl, then click and drag the mouse: this activates PowerPoint's "laser pointer" feature. To hide the pointer, simply let go of the mouse button. You can change the colour of the pointer and the annotation pen by going to the Slide Show tab and clicking Set Up Slide Show.

JUMP TO A PARTICULAR SLIDE

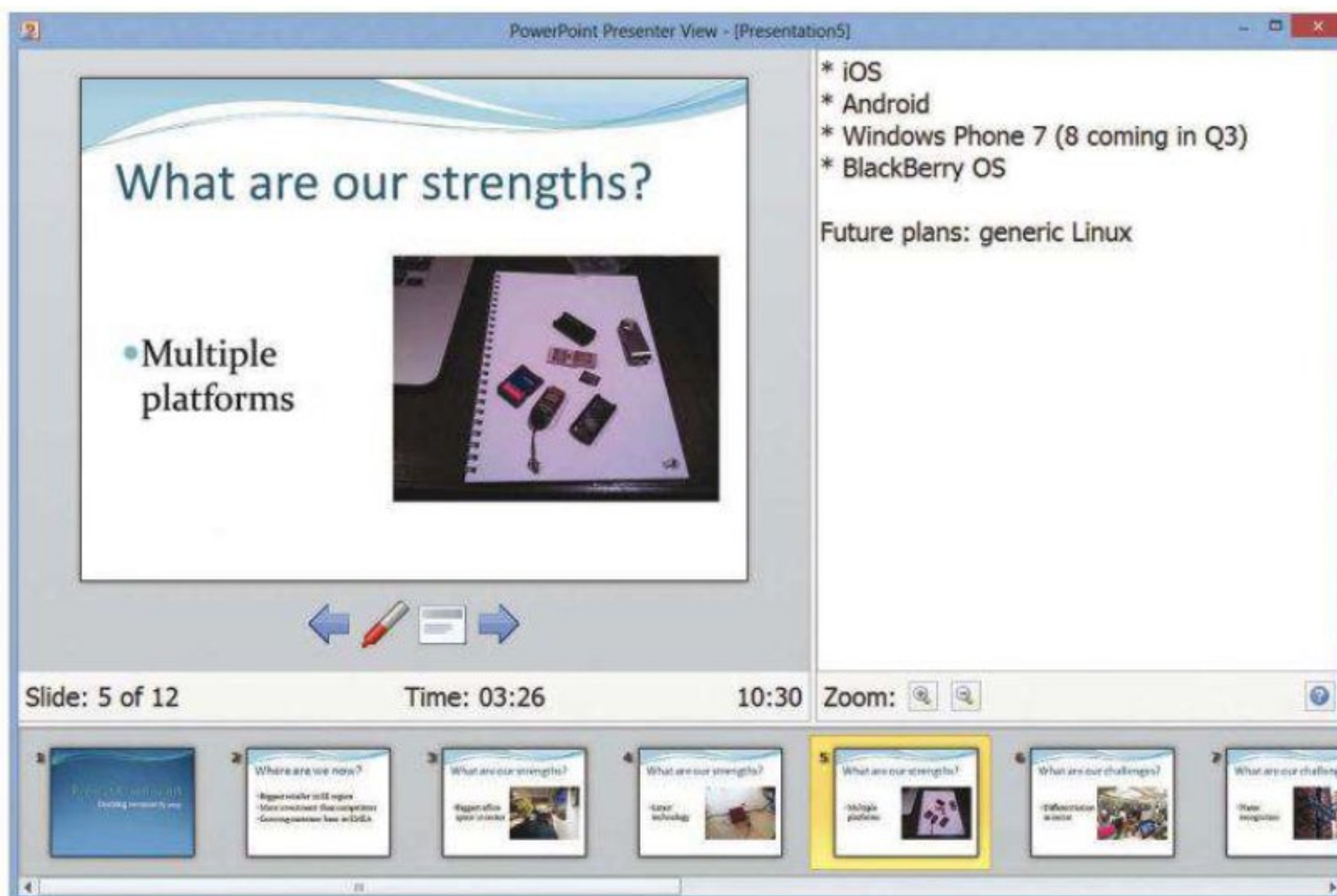
If you need to cut your presentation short, or jump back to an earlier point, you can skip directly to any slide by typing its number - don't worry that you're seemingly typing into nothingness - and pressing Return. If you type a number higher than the last slide number, PowerPoint will simply jump to your final slide, which is a handy trick in itself. Obviously you'll need to know the numbers of your slides, so it's worth keeping a printed overview of your slides to hand, or working on your memory.

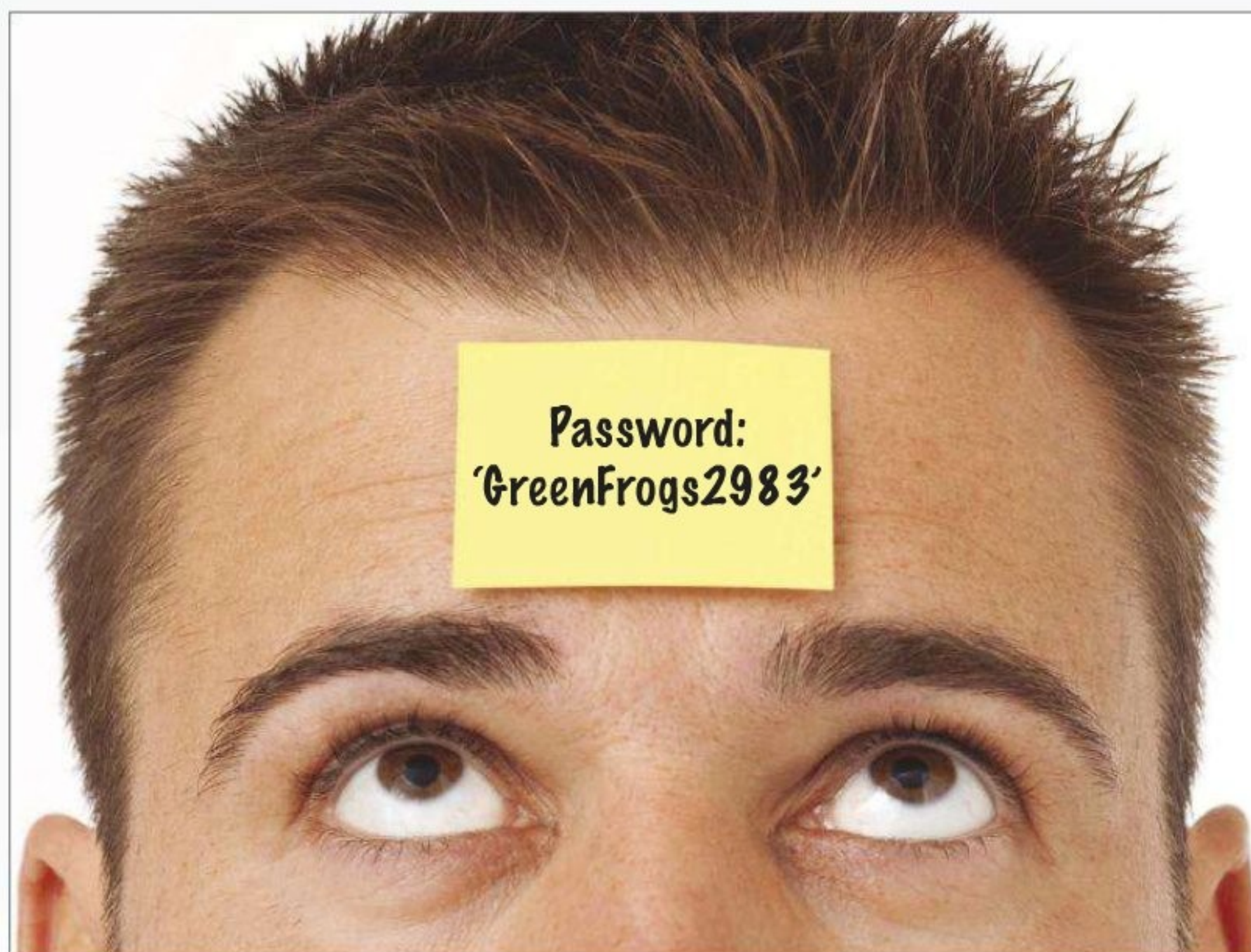
OVERRIDE TIMINGS

It can be useful to assign timings to your slides so they advance automatically as you speak. If there's an interruption, simply tap S to suspend the timer; press S again when you're ready to resume. You don't get any visual feedback to show whether the timer is on or off, so use this feature with care. But at least your audience shouldn't be aware of any timing issues.

USE PRESENTER VIEW

PowerPoint's Presenter View lets you output your slides to a projector or large screen, and still use a laptop or a secondary monitor to see an overview of the slides and any of your accompanying notes at the same time. To activate it, tick the relevant box under the Slide Show tab. Make sure the "Show on:" dropdown is set to the audience's display, so your notes appear on the correct screen. In PowerPoint 2013, you can rehearse in Presenter View with only a single monitor, then hook up the main display when needed. ■





Password failures plain for all to see

DAVEY WINDER NAMES AND SHAMES TWO BUSINESSES WITH POOR PASSWORD-PROTECTION POLICIES, AND DISMISSES A COUPLE OF "SECURITY FLAWS"

The website of the UK's Government Communications Headquarters (GCHQ) greets you with the proclamation that "GCHQ provides intelligence, protects information and informs relevant UK policy to keep our society safe and successful in the internet age". Oh, really? I fear I'll be forced to use the phrase "eating your own dog food" more than once in this column. The experience of Dan Farrall, who recently applied for a job at GCHQ, suggests the British intelligence agency has much to learn about information protection.

Farrall - a student - was looking for a job, and spotted one going at GCHQ that sounded interesting. Having registered on the website several months before, he used the "Forgotten Your Password?" box to log in and view the job application data. Now, you might think he'd be required to enter some personal data to identify himself, and then to follow a link sent to his email, via which he could continue the password reset

process. But no.

Instead, his password appeared in his browser in plain text; all it took was his email address. Farrall contacted GCHQ to let it know its system was insecure. Imagine his surprise when, two months later, he retrieved his password in plain text again.

This mistake is all the harder to swallow given the asymmetric key algorithm, an essential part of public-key cryptography, was invented by GCHQ employee Clifford Cocks in 1973.

The official GCHQ line on this embarrassing slip-up is that the system is a legacy one that's in the process of being replaced. Well, the "legacy system" excuse might wash for a small business - perhaps even a large one - but not for a government security agency tasked with information security duties. I appreciate that it's so commonplace there's even a website - www.plaintextoffenders.com - that publishes password-revealing

emails in order to shame offenders into fixing their security holes, but, as Varonis technical director Rob Sobers says, "password encryption is [not] beyond the grasp of the partner of an intelligence agency such as GCHQ". It appears it was beyond the wit of GCHQ to maintain proper visibility of something that's almost certainly being farmed out to a third-party provider, however.

This is something local councils might like to think about, too. *PC & Tech Authority* reader Jules Marshall contacted me when he received a rates bill by email and discovered security isn't as tight as it at first appears. The council outsources the delivery of the digital bills to a third-party company, and the bill itself came attached to the email as an encrypted PDF document that requires a password - his postcode - to open it.

All well and good if you open the file on your laptop, but not if you do so on your iPad. I know this because Jules sent me the PDF, which did indeed require a password to open on a desktop PC. However, a single click on my iPad opened the document to reveal the full bill, and Jules' personal details. The risk of this information being used for criminal gain is minimal, but the council evidently considers it sensitive enough to merit encryption in the first place. Neither party responded to my requests for comment in time for publication, but it's another reminder that information shared can become a liability when it falls into the wrong hands. No matter the size of your business or the controls you put in place to secure your customers' personal data, you're opening the door to insecurity unless you extend the same controls to the third parties you contract.

SECURITY GEEK FUD BOMBS

Two security stories created something of a ripple effect recently, and it's starting to annoy me - not because the authors' technical arguments are false, but because the authors appear unaware that not everyone is a security geek. This latter point is important, since security geeks can separate the theoretical, technical arguments from their real-world implications; the average end user can't, and merely reads secondhand headlines that proclaim "1Password is flawed" or "a Dropbox vulnerability has been uncovered".

GCHQ - a British intelligence agency - has much to learn about information protection

GRC's Interactive Brute Force Password "Search Space" Calculator
(NOTHING you do here ever leaves your browser. What happens here, stays here.)

☒ No Uppercase
 ☒ No Lowercase
 ☒ No Digits
 ☒ No Symbols
 ☐ No Characters

Enter and edit your test passwords in the field above while viewing the analysis below.

Brute Force Search Space Analysis:

Search Space Depth (Alphabet):	none
Search Space Length (Characters):	no characters
Exact Search Space Size (Count): (count of all possible passwords with this alphabet size and up to this password's length)	0
Search Space Size (as a power of 10):	0.00×10^0

Time Required to Exhaustively Search this Password's Space:

Online Attack Scenario: (Assuming one thousand guesses per second)	—
Offline Fast Attack Scenario: (Assuming one hundred billion guesses per second)	—
Massive Cracking Array Scenario: (Assuming one hundred trillion guesses per second)	—

Note that typical attacks will be online password guessing limited to, at most, a few hundred guesses per second.

After this FUD bomb explodes, end users inevitably panic and ask the likes of me what alternatives they recommend now 1Password and Dropbox are no longer secure. This is nonsense, of course - both are as secure as they've ever been, and switching to a potentially less secure solution on the strength of a misunderstood report is easily the greater danger.

Let's look at 1Password, the popular password manager that I use and recommend to others. It's been poked with the brown end of the FUD stick after developers of a password-cracking tool called oclHashcat-plus posted a highly technical account of a "design flaw" that enables a worrying-sounding three-million-per-second guess rate when trying to "recover" a 1Password master password.

The original story started on the Hashcat site, where it was posted by atom, one of the forum admins. Accompanying a screenshot was a statement that explained how a design flaw in 1Password allows a search rate of "nearly 3Mhash/s", between two and four times the speed normally expected. Apparently, the flaw lies in the implementation of PBKDF2-HMAC-SHA1, which is used to derive a 256-bit key. "Instead of calculating a 256-bit key in the PBKDF2," writes atom, "we just need to calculate 128-bit. Since SHA1 gives us 160-bit, we can save exactly twice the number of calls to SHA1 transform. This way I was able to

▲ Haystack (www.grc.com/haystack.htm) shows how hard it is to crack a 16-character password

reduce the calls to SHA1 transform from 8000 to 2002", hence the decrease in search times.

Online tech media quickly picked up on this, and the reporting varied from sensible to sensational. The bottom line is that while this design flaw may be a cause for concern among software architects, it quite simply doesn't impact on end users' security in any way, not least because 1Password developers have already fixed it in an earlier iOS release, and are expected to roll out a fixed version across all platforms soon. Even if the flaw remained in place, a suitably long, strong and complex master password still renders the product perfectly secure.

Jeffrey Goldberg, "Chief Defender Against the Dark Arts" at 1Password developer AgileBits, quickly confirmed the flaw is real enough, and said it's "one of the many reasons why we have started migrating to a new design" for the Agile Keychain format at the heart of the product.

Although Goldberg falls into the category of "security geek", it's reassuring when he talks about AgileBits not only "looking at the kinds of attacks that seem practical", but also "paying attention to security theorems". The new 1Password4 Cloud Keychain format was introduced to 1Password v4 on iOS in December last year, and is being rolled out to all platforms very soon.

For those of a cryptographic bent, the padding is now random, and an "Encrypt-then-MAC" construction

has been implemented for authenticated encryption, with key derivation involving PBKDF2-HMAC-SHA-512. For everyone else, nothing has really changed, so long as you employ a strong master password. Goldberg points out that if you use a three-word random diceware passphrase with 1Password (which involves picking words from a list of 7776 by rolling dice), at 10,000 PBKDF2 iterations, the Hashcat machine would have a 50% chance of searching through all the possibilities in about nine days. Use a four-word passphrase and that rises to 200 years; for five-words, it's 1.5 million years. The harsh truth is that anyone who uses a password vault to secure their logins, but locks the vault door with a weak passphrase, is a security incident waiting to happen.

So, am I worried about my 16-mixed-character master passphrase - which includes upper- and lower-case characters, numerics and symbols - being cracked by a Hashcat user? Erm, nope. In his original posting, atom suggested Hashcat could generate three million hashes per second using specialised hardware that deploys GPUs for additional computing power. For the sake of argument, let's up that figure to 100 trillion guesses per second, just to show how impractical the whole thing is. Even at this level, which would require the kind of massive cracking array only state agencies have access too, my passphrase occupies a search space of 44,480,886,725,444,405,624,219,204,517,120 permutations that would require 1.41 million centuries to search exhaustively. That doesn't mean it must take that long to crack it - they could get lucky earlier rather than later, perhaps in only half that time on average, which gives you some idea of how little practical impact this flaw has in the real world. File this whole story under "storm in a very technical teacup".

DROP THE DEAD SECURITY SCARE

I mentioned that two security stories have got my goat recently. The second involves Dropbox, which has had a lot of bad press when it comes to security issues (I'll own up to being one of those critics). However, not all of it is deserved. Take the DropSmack story doing the rounds at the moment, which appears to have come about from a presentation at a Black Hat conference looking at how cloud synchronisation services can



DAVEY WINDER

Award-winning journalist and small-business consultant specialising in privacy and security issues.

bypass the corporate firewall.

The presentation's blurb talked about using Dropbox as a vector for delivering malware to an internal network. Jake Williams, the penetration tester who gave the presentation, explained how he was hired to test a network and managed to get an "in" by spear-phishing the CIO. To cut a long story short, on the now-compromised CIO's laptop were documents held in an encrypted Dropbox sync folder, which meant Williams could send files to any other devices associated with the account. DropSmack is the name given to the tool he created in order to exploit his access to the corporate network. It's undoubtedly smart stuff, and security geeks might - quite rightly - get a little turned on by its cleverness. What it isn't, however, is a vulnerability in Dropbox.

In order for DropSmack to work, the pen tester had to embed his malware into an already synced Dropbox file, along with a clever macro script; load that file back onto the compromised laptop, where it would automatically sync again; then wait for another user to open it on the corporate network. Once all this was done, DropSmack enabled arbitrary actions to be performed on the network, such as uploading and executing new malware tools. At the Black Hat conference, Williams demonstrated how he could capture a home directory, IP configs and program directory using this technique - but that still doesn't mean Dropbox is compromised in any way, and even Williams admits it's only the conduit. You might as well say TCP/IP is compromised, since most viruses are delivered over it.

The real vulnerability here is one that's likely to be overlooked by many people who read a "Using Dropbox to steal files and deliver malware" headline and don't fully understand the process required to execute the DropSmack attack. It lies with the CIO who was socially engineered out of his password in the first place.

I'll admit I use Dropbox regularly, as do all the contributing editors at *PC & Tech Authority* (it's how we submit our copy nowadays), but I'd encrypt anything that could be deemed to contain sensitive or confidential material long before it reached my Dropbox account.

The Black Hat presentation (which you can see at <http://tinyurl.com/k936ddw>), and the original story that reported it, were accurate

► 1Password's widely reported "design flaw" has no real-world impact on users' security

DropSmack is clever stuff, but it doesn't reveal a vulnerability in Dropbox



and non-sensational, but, after the inevitable ripple effect, Dropbox - not the naive CIO - became the bad guy. And what was the social engineering tactic that worked for Williams in this case? Having found the CIO's Facebook account and discovered he was fundraising for his child's Parent Teacher Association, Williams emailed a document containing fundraising information, along with some malware.

FACEBOOK GRIPE OF THE MONTH

I might once have claimed that not a month goes by without some aspect of the Facebook UI rubbing me up the wrong way, but that's all changed - it's now a daily occurrence.

Nevertheless, I - and a billion other people - carry on using it, which is a testimony to the grip social media now exerts on our lives. However, this doesn't excuse the fact that some of Facebook's UI silliness borders on insane.

Take the matter of editing your posts, for example. If I write a comment on someone else's post, I can edit it at will by clicking the pencil icon in the top-right corner. If I share a link from an external website, I can edit its details before posting it (by clicking on its description and URL fields to enter Edit mode). But here's the kicker: I can't edit anything I posted as my status. Allowing you to edit your comments but not your original posts is just daft.

Remember my obsession with not eating one's own dog food? Well, I stand vulnerable to a similar accusation, since members of the DaniWeb community I help run can't edit their own posts at all beyond a 30-minute window after publication.

I'd argue that Facebook is a different kettle of fish from DaniWeb, which is a support community in

which postings make up its support database. Allowing people to alter or delete their posts willy-nilly would devalue the content of that database, and the effort put in to answering problems by other members.

Facebook, on the other hand, isn't a support community - at least not in the same technical sense - and yet it doesn't offer this limited 30-minute editing window.

The argument that threads would be rendered senseless, or reputations might be sullied, if messages could be edited after posting, falls down when you consider it's only the original "seed" post that can't be edited: comments that follow it can be changed at will.

Seriously, Facebook, sort it out: it's starting to look as if your developers are driven by eye-catching gizmos and are incapable of thinking a process through to the end. ■

FREEBIES RULE!

Is it the end of paid-for security suites? A new IT security survey from AV-Comparatives doesn't go quite so far - it says 55.2% of users still use a paid-for internet security solution - but free products are making more impact than ever before. In North America, the most popular solution is Microsoft's free Security Essentials, and my own survey of friends, family and small-business owners suggests we're not far behind. Microsoft, Avast and AVG's free offerings are widely preferred to preinstalled McAfee and Norton products, which are often immediately removed from newly purchased laptops. Do you use free or paid-for security? Let us know!

Input Output



DAN RUTTER BRINGS THE ANSWERS TO YOUR QUESTIONS LIKE NO-ONE ELSE CAN

CABLE PAIN THE FIRST

I The sockets on the back of my monitor face downwards, and there's a lip around them, so the only way to see them is by lying on your back under the desk facing up or by putting the monitor flat on the desk.

I kind of understand why this is, the facing-downwards part anyway, because that stops the cables being squashed if you push the monitor up against the wall. But now that I think about it, it occurs to me that about one computer socket in ten is actually readily accessible and easy to plug things into.

How do people who work on computers all the time deal with this without going crazy?

T. Iggi

O There are indeed practical reasons why most computer sockets are where they are and face the way they face, but this is, as you say, also frequently highly annoying. Identical non-interchangeable sockets right next to each other (monitor outputs, audio jacks, the old PS/2 sockets...), sockets that always seem to require at least three attempts to get the plug the right way around, and so on and so forth.

Whenever possible you should of course yank the computer in question out from wherever it is so you can actually see what you're doing, but when that's not possible, here are some hints:

- A dental inspection mirror is not tremendously helpful, but it's better than nothing and very cheap.
- An optic-fibre inspection scope or "snake camera" with its own little screen is much better than a mirror, but also complete overkill. But don't let that stop you using this as an excuse to buy one!
- If you can get your finger or thumb onto an unknown invisible connector, press said thumb firmly onto it, then inspect the dent it left in your flesh. Plug orientation...

revealed!

- Got a smartphone with a front-facing camera? Poke the phone in there and see what you can see.
- Got a digital camera or phone with built-in panorama features? Click several pictures of the back of whatever device is giving you grief, and stitch 'em together into a geometrically untidy but highly informative result!

(You can also do this with photos from any camera and Photoshop, or various other imaging software. That's ridiculous if you're only trying to figure out which way up the video socket on the back of a computer is, but if you're dealing with a monster home theatre amp or scientific equipment or something, it could be justified.)

CABLE PAIN THE SECOND

I I just plugged a USB cable into the back of my PC.

What I plugged it INTO, though, was not a USB socket, it was a network socket.

My computer had a motherboard Ethernet socket. A bit of investigation revealed that it still has that socket, but not that network... card, or whatever you call it when it's not a card but built into the board.

▼ Each more diabolical than the last

I was connected to the actual network via a USB Wi-Fi dongle, and that still works, but I'm going to need to buy an actual network card if I ever want to connect to a wired network again.

My question for you isn't "how can I magically fix this fried motherboard network thing", but "why in the hell is it possible to plug a USB cable (invented 1996, according to Wikipedia) into a network cable socket (invented 1990, *ibid.*), and blow the damn network thing up?!"

Isaac Temple

O I don't know either. Six megacorps contributed to the original USB standard, though, so I'm currently visualising a large room full of engineers all pointing fingers of blame at someone else.

However it happened, USB Type A plugs are a *snug* fit in an "RJ45" Ethernet socket, but yes, they do fit. And if you push them in far enough they short all of the Ethernet pins together.

The effect this will have is variable.

If everything's turned off and you don't really mash the plug in there, there should be no electrical or physical damage to anything.

If it's an ordinary 10BaseT-to-Gigabit-Ethernet device that's powered up, shorting its pins may or may not kill it, probably without



much drama.

If it's a Power-Over-Ethernet socket, though, it is entirely possible that there will be excitement up to and including actual flames.

In all of these cases a USB device on the other end of the cable should be fine, since it's just the beefy rectangular shield portion of the USB A connector that's shorting the pins. Even if there's fire and flame, it probably won't even mutilate the USB plug.

(Oh, and the generic term for a network adapter whether it's a standalone object or built into something else is just "network adapter", or Network Interface Controller, "NIC", if you're fancy.)

DIDN'T EVEN NEED ANY FENCE WIRE

I The plugpack for my ADSL/Wi-Fi/router thing went pop earlier today, but I noticed it was a 12-volt, 1-amp power supply, barrel outside negative and barrel inside positive. I fossicked through my drawer of old phone chargers and other crap and found a power supply matching the electrical specs and with a barrel plug almost the right size.

The replacement plugged in but didn't make contact properly - the hole in the middle is too big. So I threw sanity to the wind and just crumpled up a little bit of aluminium foil and stuffed it in there with a toothpick. Seems to work fine now, if this email gets to you anyway!

So I suppose this is another one of those letters asking "will my brilliant idea burn my house down tonight, or will it wait a week or two"?

Helen Toft

O This is the sort of thing that brings to mind "if it's stupid but it works, it's not stupid". I'm racking my brain to think of reasons why this could go wrong, but I really can't think of any way in which poking foil into the inside of a normal two-contact barrel plug could cause a serious problem.

It could perhaps get compacted and stop making contact until you put *more* foil in there. Or a bit of spring from a ballpoint pen... whole new vistas of ill-advised power-plug modification are opening up for me, here.

The worst I can really see it doing, though, is coming back out enough that it shorts the plug and you need to find yet another plugpack.

The *proper* way to replace a plugpack is of course to choose one with the right electrical specs and connector, or replace the connector with one that fits the device properly.

The only further concern is to make sure you're using a *regulated* plugpack, that outputs roughly the same voltage no matter how heavily loaded it is, up to its current limit. Old-fashioned heavyweight plugpacks (which are chiefly composed of iron-cored transformer) often aren't regulated, and can deliver a dangerously high voltage - up to root-two times the rating - into a light load.

(If a plugpack's regulated, by the way, then it doesn't matter if its current rating is higher than the one it's replacing.)

Some old plugpacks may even

give AC output - for some reason, plugpacks for phone-line modems were often AC. But virtually all modern plugpacks are lightweight regulated DC world-compatible types, and almost always the right polarity, too. Almost anything with a barrel plug will be outside-negative, inside-positive.

All that said, though, you can't argue with success.

Correspondence is requested from any readers who are more imaginative than me about how this bodge job will result in Helen's fiery death.

IF YOU HAVE A QUESTION FOR DAN RUTTER, SEND HIM AN EMAIL AT IO@ATOMICMPC.COM. AU, AND HE'LL TRY TO FIND A SOLUTION FOR YOU.

I/O OF THE MONTH

TERRY GILLIAM COMPUTING

I Now that there are monitors on laptops that have the same four megapixel resolution as 30-inch desktop screens, could you get the same effect by putting a magnifier in front of one of the smaller screens? If we can fit HD displays into an Oculus Rift, shouldn't we be able to make a desktop monitor that uses one of those laptop panels?

Luke Goderich

O You definitely could put one of the super-resolution laptop panels (the ones Apple calls "Retina") in a desktop monitor casing, but people sit far enough away from desktop monitors that most of the extra resolution would be wasted. I think this is why nobody seems to make such a monitor. And, unfortunately, sticking magnifiers in front is not going to come near solving that problem.

There are, for a start, severe viewing-angle problems if you stick a magnifier in front of a whole screen. Even if your screen panel has a very wide viewing angle - as all but the cheapest today usually do - there's no way to make a simple lens that'll make it look "the same, but bigger". Looking through the lens at an angle will always be a problem.

Make a lens with varying focal length all the way across it and you could get closer to achieving this, but it'd still be intensely sensitive to the location of the viewer's eyes. Actually, it might not even be practical to make such a contraption that you could view with both eyes at once, when the panel you're viewing

only has a seventeen-inch diagonal.

A projection system with a concave screen would work much better, but the closest you can get to that in consumer hardware is multiple monitors in a highly polygonal curved array.

It is, however, possible to make screens - and everything else close to you - seem bigger, by simply attaching lenses to your head. This is exactly what commonplace non-prescription reading glasses do.

Anybody who doesn't normally wear corrective lenses can try this out with a sub-\$5 pair of eBay reading glasses. 1.0-dioptre will do the job, 2.0 is more dramatic but less practical, higher dioptres may be needed if you're longsighted in the first place.

Move monitor closer to you, put on reading glasses, observe monitor that now seems bigger and further away.

Three-dioptre glasses for me make it impossible to focus on anything more than about thirty centimetres away, but they're great for working on tiny fiddly objects like circuit boards. And they turn my thirty-inch monitor into an IMAX screen!



▲ I'm seeing this movie in a whole new way.

DVD CONTENTS

GAMES, ESSENTIALS, FULL SOFTWARE, DRIVERS & MORE!

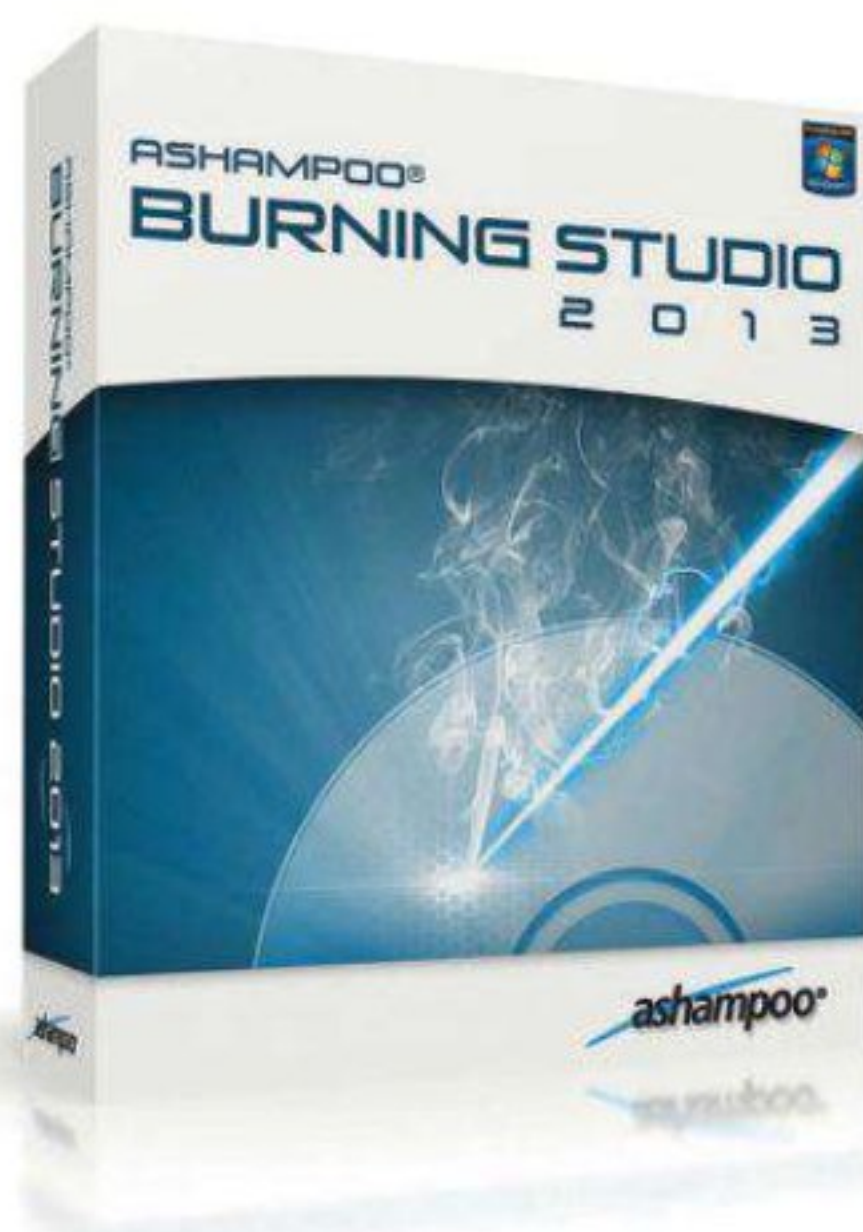
Each issue, we aim to provide all *PC & Tech Authority* readers with a full suite of simple yet important applications, along with a variety of extended trials and full programs that are both useful and interesting.

This month, we've got two great applications from Ashampoo. Burning Studio 2013 is perfect for making either data discs or audio compilations, while GetBack Photo is ideal for recovering lost images from a range of devices.

Our game demo this month is the cleverly titled *Game Dev Tycoon*. Do you have what it takes to make a hit?

That's it for this month – as always, please send any feedback and suggestions to dvd@pctechauthority.com.au

We'd love to hear any suggestions you have for improving our DVD.



Ashampoo Burning Studio 2013

Ashampoo Burning Studio 2013 is a compact, simple, but surprisingly feature-packed disc burning suite.

The program makes it easy to create simple data discs and audio CDs, for instance: just drag and drop your files onto the list area and you'll be burning the

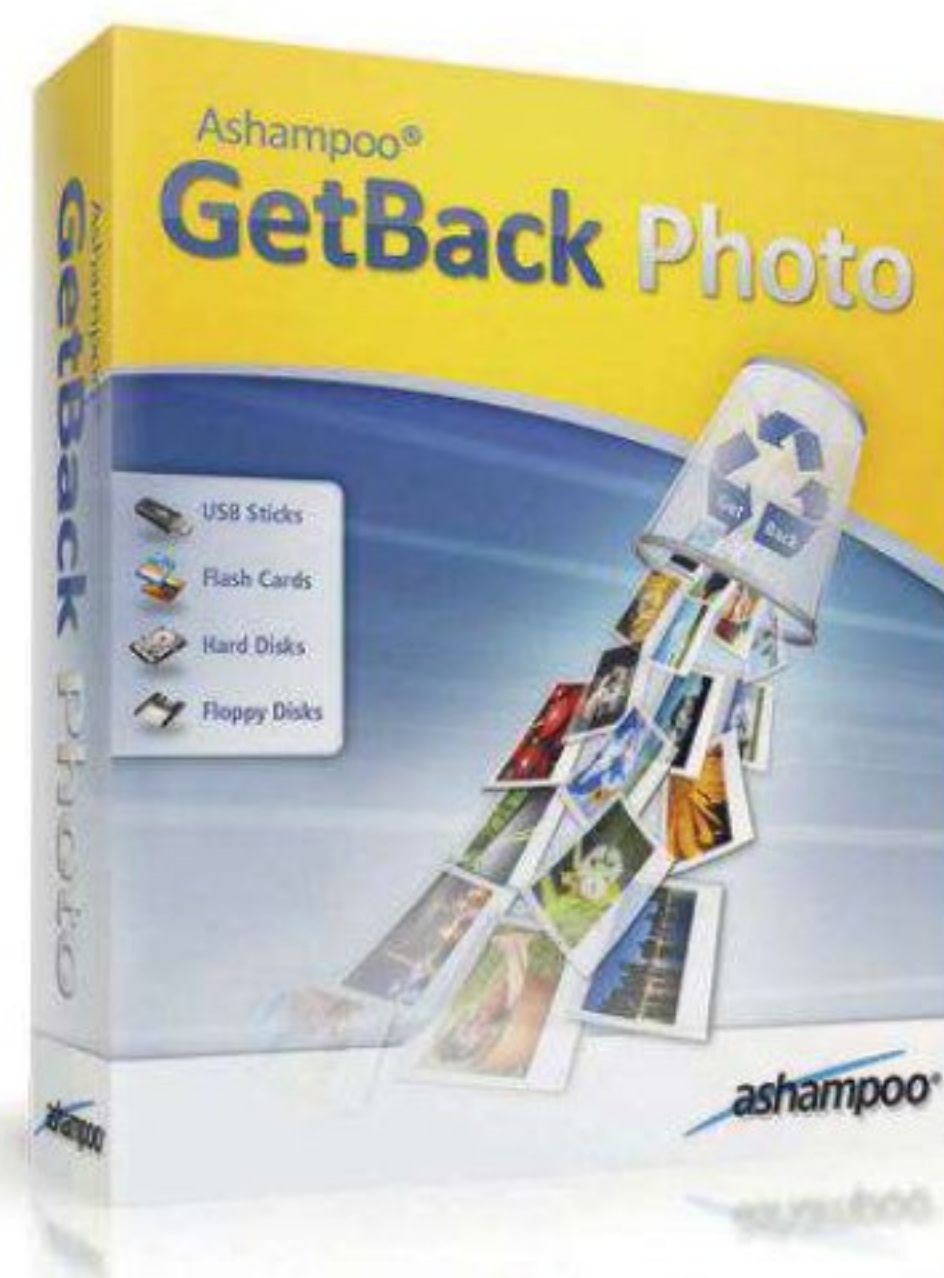
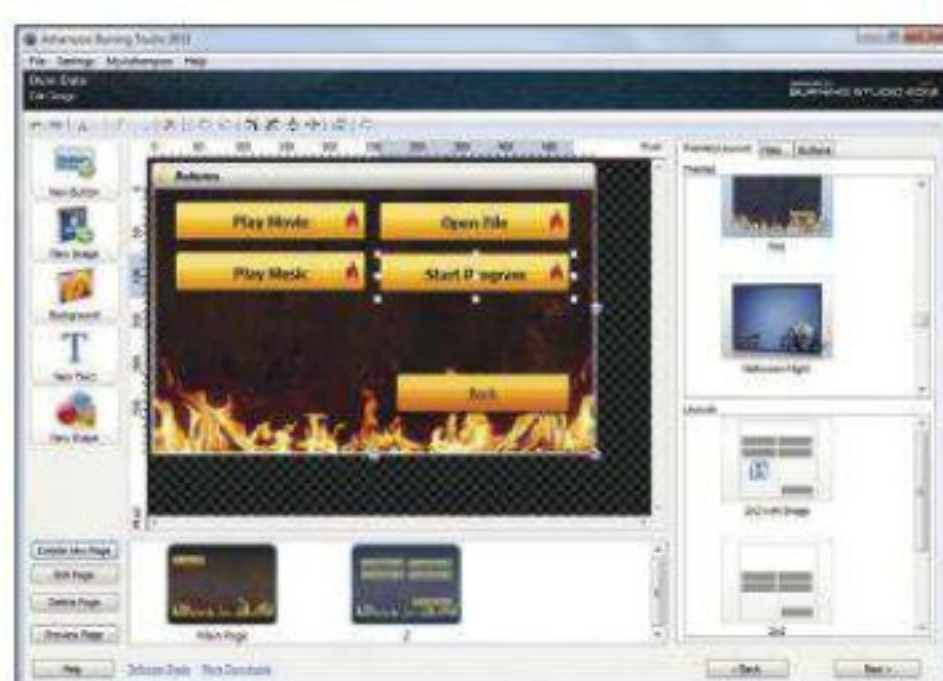
finished disc in a couple of clicks.

That's just the start, though. Burning Studio 2013 can also create data discs with customised, interactive multi-page menus, perfect if you'd like a more professional way to share and present the disc contents.

A built-in backup tool allows you to create backups which may be encrypted, compressed, and span several CDs, DVDs and Blu-rays.

And there are modules to create VCD or SVCD video projects; burn video DVDs or Blu-ray discs from prepared folders; create, browse or burn disc images (ISO, CUE/ BIN and Ashdisc formats are supported); copy discs, erase them, design and print disc covers, labels and booklets, and more.

The focus throughout is on ease of use, though, and so Ashampoo Burning Studio 2013 remains very straightforward, whatever you're doing. Most disc projects are created via the same simple interface, and for the most part all you have to do is drag and drop the necessary files. But experts will find more advanced options are only a click away, and if you need to then you can set ISO and UDF version, enable Joliet, make a disc bootable and more.



DID YOU KNOW?

You can find a guide to using ISO files in the Editorial section of the DVD



Ashampoo GetBack Photo

With Ashampoo GetBack Photo the loss of digital photos doesn't have to be permanent. The program enables the quick recovery of photos from different storage devices in just a few steps.

In contrast to many conventional undelete programs, Ashampoo GetBack Photo recovers not only photos that were deleted "normally", but also images from storage devices that have already been formatted.

Did you know that the chances of a successful recovery become increasingly smaller the more data is written on or deleted from your external hard disk drive and USB flash drive!? Download Ashampoo GetBack Photo now, be prepared for any emergency and recover your photos before it's too late!

Program features:

- Recovery of deleted or damaged image files
- Scan of all storage devices in the system
- Photos might even be found, after the storage device was formatted
- Metadata is also recovered, e.g. EXIF and IPTC
- Support of all common file formats, e.g. JPG, PNG, BMP,
- GIF, RAW
- Photos are also found in file formats such as PDF and Word documents
- Display of recoverable photos as thumbnails



Games: Game Dev Tycoon

Game Dev Tycoon is a business simulation game available for Windows, Mac and Linux as well as on the Windows 8 Store. In Game Dev Tycoon you replay the history of the gaming industry by starting your own video game development company in the 80s. Create best selling games. Research new technologies and invent new game types. Become the leader of the market and gain worldwide fans.

And don't forget to watch the engine's pressure level...



PC & TECH AUTHORITY

DVD CONTENTS

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FEATURED: Ashampoo Burning Studio • Ashampoo File Wiper • Ashampoo GetBack Photo • Game Dev Tycoon **WINDOWS:** 7Zip • CCleaner • Deep Burner • Defraggler • Foxit Reader • Apple iTunes • Malwarebytes Anti-Malware • Sandboxie • Songbird • Spybot Search & Destroy • VLC Media Player • WinRAR • WinZip • Avast Free Antivirus • AVG AntiVirus Free Edition 2011 • PC Tools AntiVirus Free **INTERNET:** AOL Instant Messenger • Vuze • Google Chrome • Feed Reader • Filezilla • Internet Explorer • Microsoft Security Essentials • Mozilla Firefox • Mozilla Thunderbird • Skype • ZoneAlarm **DRIVERS:** ATI • Nvidia • Direct X • Realtek Audio Codecs • VIA Hyperion Drivers **LINUX:** Linux Mint

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@pcauthority.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.

Application makeovers made simple

SIMON JONES MAKES LIGHT WORK OF SOME SERIOUS AESTHETIC UPDATES TO AN APPLICATION, AND SIDESTEPS POWERPIVOT TROUBLES THANKS TO EXCEL 2013



If you make applications that you expect will remain in use for a long time, or even might end up lasting a long time by chance, you might want to build in from the start the ability to update their cosmetic appearance. Many office applications follow the trend set by Microsoft Office, which tweaks its colour schemes with every new release. Using Microsoft Office as the reference point for your applications can help your users get used to changes more quickly, since they'll look familiar. Updating your application to follow Office's changing face will ensure that it doesn't start to look dated after the rest of your users' working environment has moved on.

If your own applications are written using Windows Presentation Foundation (WPF), you can employ Microsoft's Expression Blend to refresh their UIs at any time, but many applications are still written using Windows Forms rather than WPF (perhaps because their developers haven't had the time to move to WPF, or the application was started before WPF became a viable proposition). While development environments such as Visual Studio are supplied with a substantial toolbox of Windows Forms controls that you can use in your application, many developers buy in extra control suites from manufacturers such as ComponentOne, DevExpress and Syncfusion that add extra features such as better grids and innovative docking. Some of these third-party control suites also add the ability to re-skin an entire application without having to change every look and feel property at design time.

Such control suites are a large investment for any software house, costing perhaps a thousand dollars or more for each developer seat, plus several hundred dollars a year per developer for support and updates. Most software houses quickly settle on one particular suite because of this cost.

We use the NetAdvantage suite of controls from Infragistics for most



AppStylist functionality can be incorporated directly into your application



of our Windows Forms applications. All the controls it contains have a standard set of properties that set their look, including ButtonStyle, ViewStyle and rafts of Appearance properties. While you can change each of these properties at design time, it's far more efficient to use the supplied Infragistics AppStylist program to apply a new skin to your whole application in one go.

AppStylist creates small (smaller than 200KB) XML-style library files, with the filename extension ISL, which describe all the style and appearance settings for each type of control used in your application. It comes with 23 style libraries that you can use as the basis for building a style library of your own. Applying this style library to your application is just a matter of adding one line to its startup routine:

```
AppStyling.StyleManager
Load(My.Application.Info
DirectoryPath &
"\Resources\StyleLibrary-2013
isl")
```

If you then distribute the style library ISL file as a resource file in your application's installation kit, all you need to do to transform the look of your application is change that line. If you've used standard Visual Studio controls as well as Infragistics ones, you can control their appearance through a style library by adding an extra InBoxStyling control to all your forms. Of course, you won't get as much power over the Visual Studio built-in controls as you do over the Infragistics ones, since the standard controls don't have such flexible properties.

AppStylist shows you an example of every type of control, spread over a dozen different tabs. Moving the mouse pointer over one of these controls brings up a tooltip that invites you to press a key on the keyboard to select which part of the control you want to style. For example, on a grid control, you'll be offered access to GridCell, GridRow

and GridControlArea. A panel at the bottom of the window then shows the different states applicable to that part of the control - Normal, Selected, HotTracked, Active and so on - and within each of these states you can set the properties for background, border, text font/size/colour and so on. Backgrounds can have gradient fills or images applied to them, text can be bold, italic, underlined or struck out, and all the changes you make are instantaneously reflected in the controls displayed above. With judicious use of these properties, you can make your application look exactly as you want.

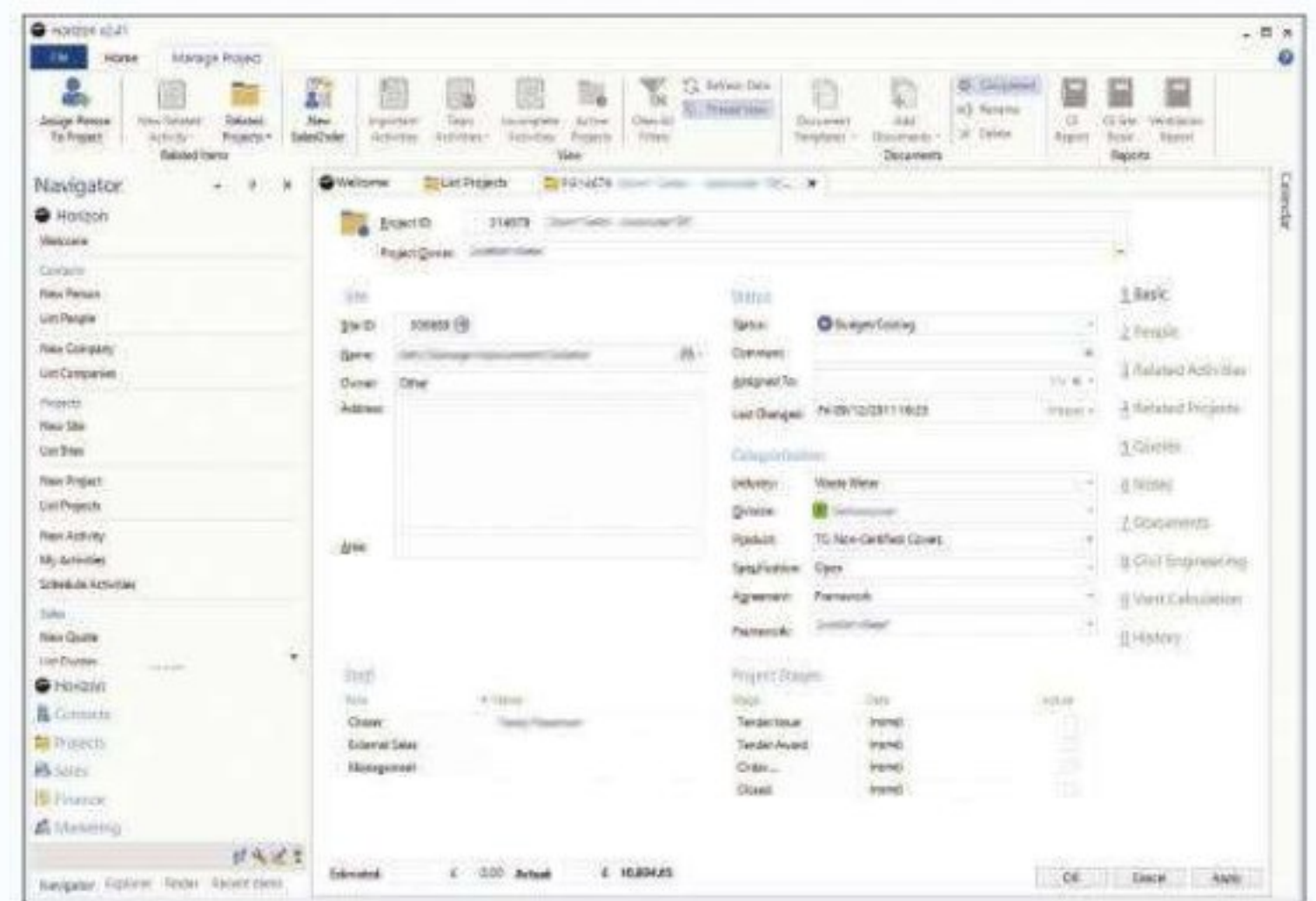
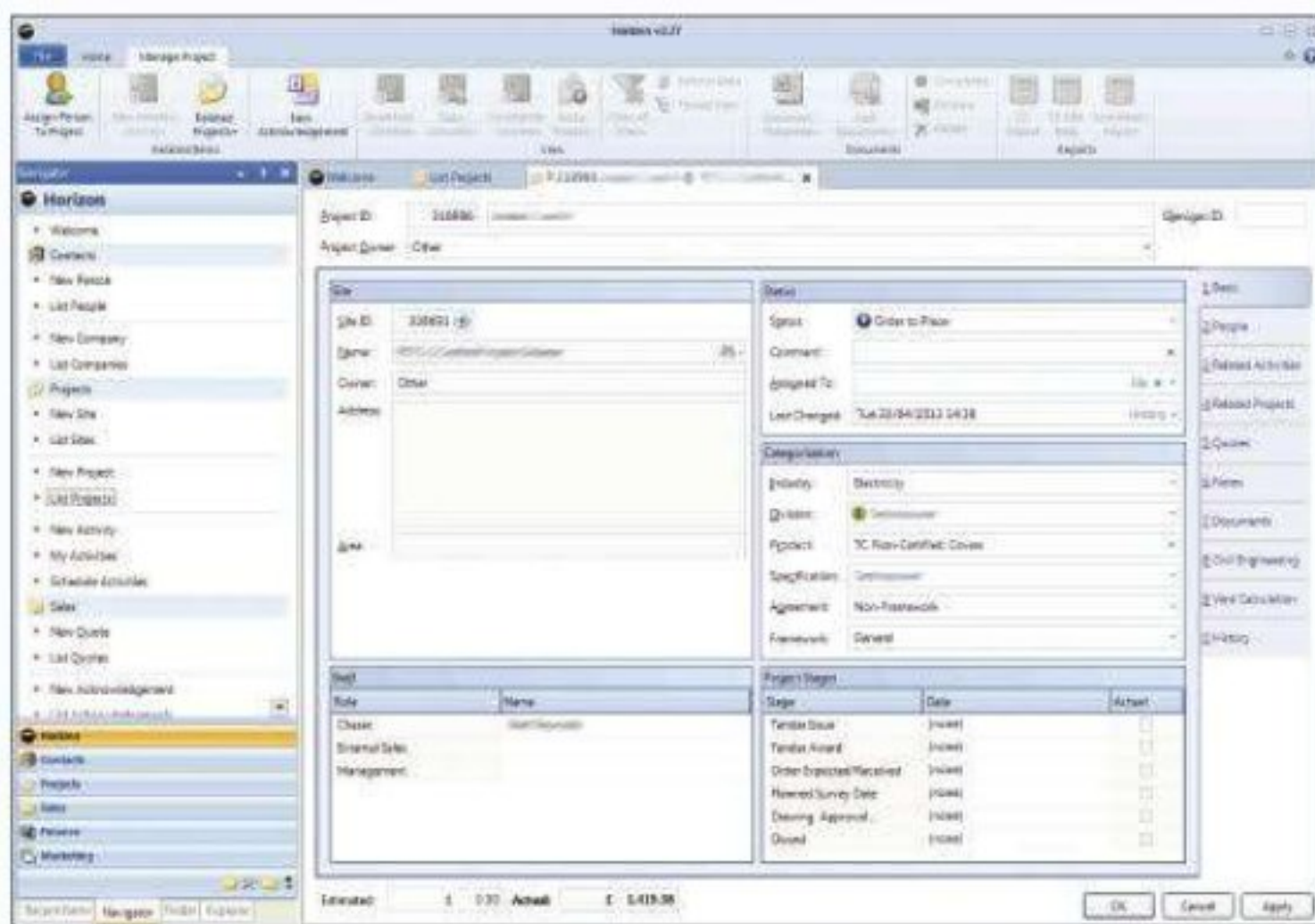
To make things easier still, you can incorporate AppStylist functionality directly into your application. This means you can style the controls from within the app and see the changes in context, rather than design the look separately and only see it applied to your application later.

One gratifyingly long-lived application we designed started in 2007, and it followed the look and feel of the then-recently released Office 2007; baby-blue colour scheme, ribbon interface and all. We gave its UI a minor update in 2010, this time following Office 2010 (although we stayed with blue, rather than changing to Office 2010's default grey). With the release of Office 2013, we gave it yet another makeover, but this one needed to be far more radical than the previous updates.

Two of the guiding principles of Office 2010's new UI design are clean layout and good use of typography. Clean layout means reducing clutter wherever possible, especially by eliminating unnecessary lines, while good typography is exemplified by employing different colours or sizes of text to indicate headings, which further reduces the reliance on lines to separate or group elements. The application we were re-styling uses quite complicated forms, most of which have tabs containing groups containing controls; eliminating the borders from these tab and group controls made the forms look much



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more open.

We also reduced the intensity of the borders on the textboxes and other controls, changing them from black to Gainsboro (a light grey), and set them to turn Silver (a slightly darker grey) when HotTracked. We made grid, row and cell borders as light as possible, so the data stands out more clearly than the grid structure, and picked out group headings in 11pt Segoe UI blue and grid column headings in 9pt Segoe UI green. All other text was set to 9pt Segoe UI black.

Our application has tools surrounding the main data, not only a ribbon but also a navigator, explorer, finder and more. We made all these controls look like Word 2013 Task Panes, with large blue heading text and a very light grey (WhiteSmoke) background. We used the same WhiteSmoke colour to indicate read-only controls.

There are millions of combinations

▲ LEFT: The 2010 version of our application doesn't fit with Office 2013 RIGHT: Our application was overhauled for 2013 with no additional coding

▼ This New Delivery Note icon was designed using a document icon with added overlays

of controls, states and roles for which you can set properties in AppStylist, but you can reduce the length of time it takes to re-skin an application by making changes at the highest level possible. All the settings are inherited from the base setting, which is where the most basic properties – like the colour of text and read-only controls – are set. You only have to override these properties further down the tree if you need to differ from the base setting. For example, scrollbar controls have vertical and horizontal variants, and these have individual track, thumb and up/down and left/right buttons. However, setting the base properties once for the Scrollbar control removes much of this complexity.

Checkbox and RadioButton controls need special handling, since they're composed of several images for Checked, Unchecked and Indeterminate states during Normal,

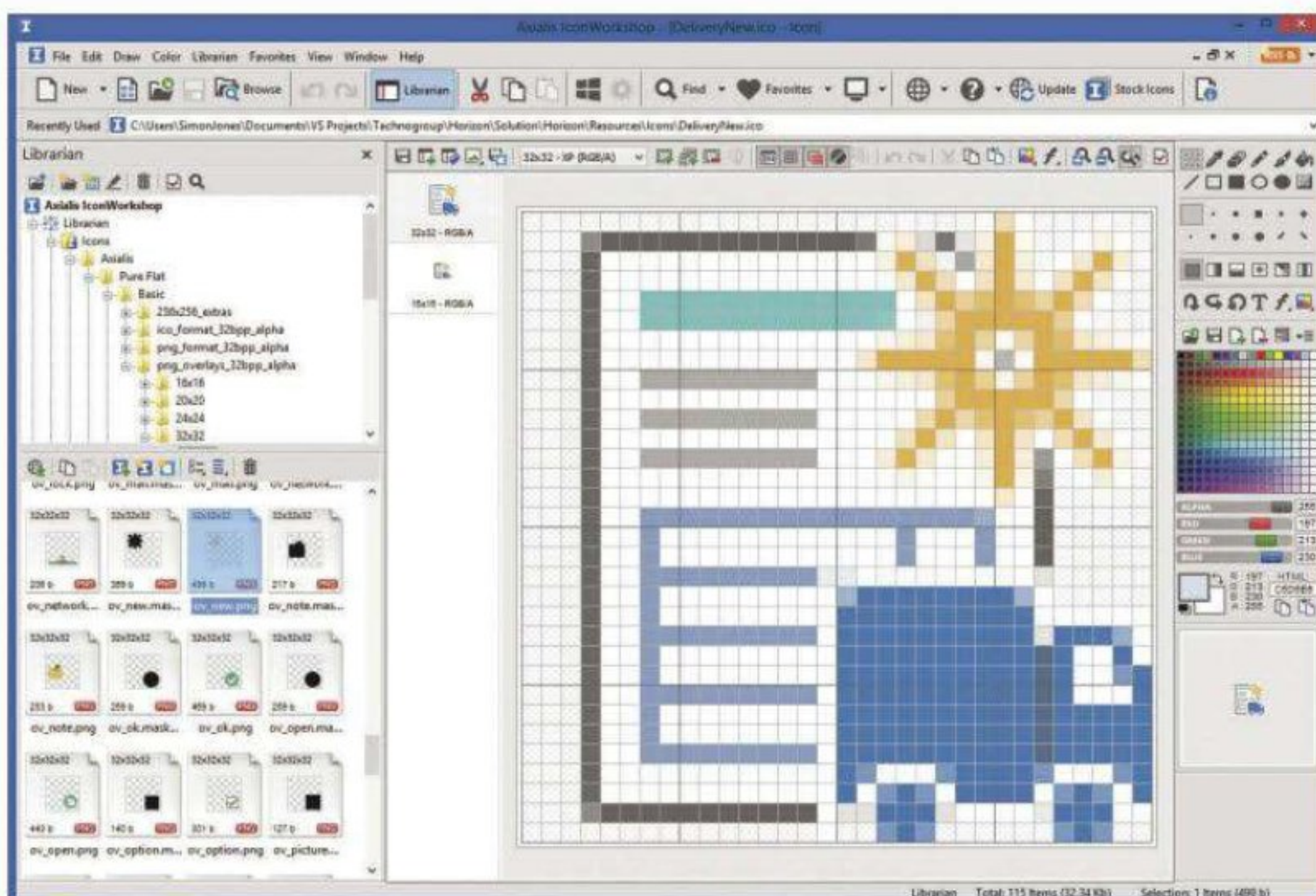
Mouse Over, Mouse Down and Disabled events. Creating all these images and adding them to the Style Library takes some time, but you have to do it only once.

STYLE ICONS

One thing AppStylist can't do is change the icons used in your application. Icons are defined as resources in your application's project, and changing them is a big job. However, a makeover as radical as the one we undertook would look strange if it kept exactly the same icons, since they wouldn't fit in with the new look.

I've been critical in the past of the new icons in Office 2013, and more so of those in Visual Studio 2012. I find Office 2013's icons far too grey, although they do have a little more colour than those in Visual Studio 2012. The main problem is that nothing in them is black, which reduces contrast and makes it difficult to distinguish one icon from another. Visual Studio 2012's icons have the additional problem in that they're in a small 16 x 16 format and are dark grey; at least Office has the advantage of being able to use a larger 32 x 32 format, since it has a ribbon interface.

As our application has a ribbon interface, we wanted to give it new icons that complement its new, flatter appearance. We also wanted them to be reasonably colourful. To make these icons we used IconWorkshop from Axialis, which is probably the best icon editor available. Axialis recently started selling a range of pre-built icons called Pure Flat. These seemed to fit our bill well, as they have a clear, uncluttered appearance and use only six standard colours. There are five sets of icons in the Pure Flat range – Basic, Database, Business, Multimedia and Word Processing – which cost \$39 a set (\$US49 for the Basic set), but IconWorkshop users can get them



half-price.

We were able to use many of the Pure Flat icons as they came, but certain features and functions of our application needed special icons, which we designed using elements from the Pure Flat sets. As well as pre-built icons for functions such as Add User or Clear Filter, Axialis ships its icons as plain shapes with a separate set of overlays – those little glyphs signifying new, add, customer, remove and so on, which you can stick onto any main icon. Wherever we needed a specialised icon, we could easily combine a basic icon with one or more of these overlays to create the image desired. A major group of icons in our application represents business documents such as quotations, purchase orders, delivery notes and invoices, so I designed a standard icon to represent a business document, then overlaid a speech bubble, a shopping cart, a delivery truck and some coins to illustrate the different document types. These in turn could have an extra “new” sparkle or an “edit” pencil overlaid to indicate the different functions that can be performed on each type of document.

We tried to make the placement of these extra overlays as consistent as possible. The “new” sparkle is always in the top right, while the plus sign for “add” is always in the bottom right. This consistency is invaluable to the user experience: people feel more comfortable using the application once they’ve learned the “grammar” of these modifying symbols. They know that a “+”, say, always means “add”, whatever kind of document they’re dealing with.

Designing for a ribbon interface means that many icons – both small and large – are needed, because some buttons change size according to how big you make the window. Don’t make the mistake of designing one size and allowing the application to scale the icons for you – it never makes a good job of it. Overlays and other important features need to be made relatively bigger in small icons so they remain intelligible: if you merely allow a large icon to be scaled down, often you won’t be able to tell what it’s meant to represent; if you design one small icon and have it scaled up, it will become fuzzy.

Axialis IconWorkshop can scale your icons up and down, and it makes a better job of it than Windows. If you do choose to scale up or down, you should always check the result and manually tidy up or adjust where necessary. There are more than 500 icons in the

CAPITAL OFFENCE

What we definitely haven’t copied from Microsoft Office 2013 and Visual Studio 2012 is their unreadable ALL CAPITAL LETTER captions on ribbon tabs and status bars. Reputable ergonomic research shows that using all caps increases the time it takes to read words, while also reducing comprehension. Road signs employ mixed case because we more quickly and easily recognise the shapes of words when they have a mixture of letter shapes. Microsoft’s boneheaded insistence on all caps is just plain stupid.

project we were updating, so renewing them all took many hours, but it was worth it. The new icons sit nicely with the new style library, giving the application a unified look; they’re clear and precise, so users can easily see what each one represents.

PIVOT POWER

Recently, I’ve been analysing the way one of our customers uses its Dynamics CRM (customer relations management) system. Although its data is contained in only five tables, the main one, called Audit, is large, with nearly 700,000 rows, which is quite challenging for Excel. PivotTables offer the flexibility required to analyse data any way you want, and they are far more flexible than writing a static report format, but the sheer volume of data returned for analysis is a problem.

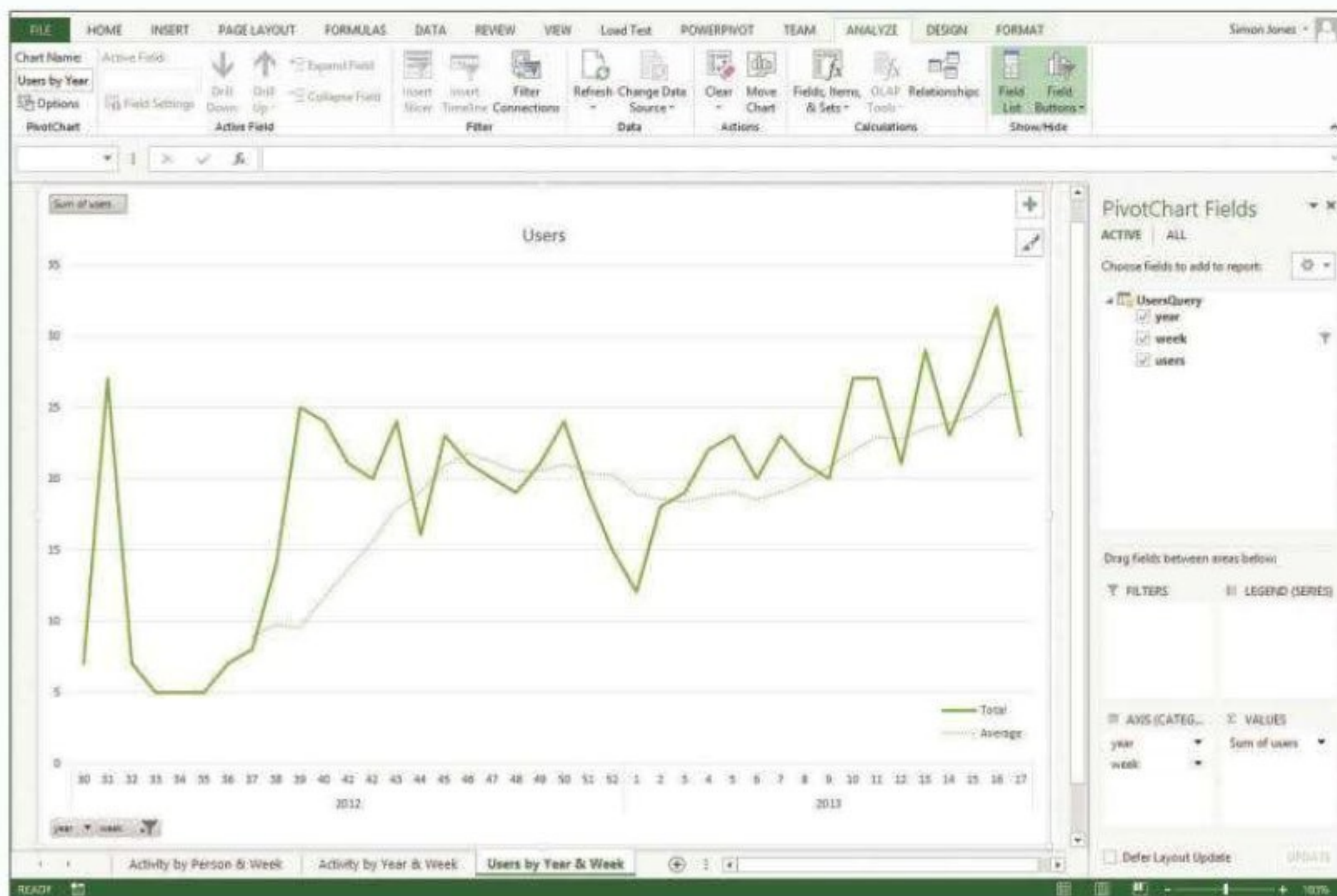
Since XLSX files are zipped internally, the data file occupies only 36MB. However, it takes several minutes to open, and often complains that it needs “more resources” and that I should close other applications,

Analysing 700,000 rows of data with PowerPivot is quick and pain-free in Excel 2013

even though my PC has 12GB of memory to play with. Sometimes after an update to the data it won’t save, and it corrupts very easily – I’ve recreated the file a few times, but always with the same result. Even if I do very little analysis, merely creating a PivotTable and closing the file, for example, it’s still very fragile.

Excel 2013 comes with PowerPivot built into the main application – it was an optional add-in in Office 2010 – and it employs a new method for storing data more efficiently. Using PowerPivot in Excel 2013, those 700,000 rows of data can be saved to a file that’s only 1.3MB in size – 3.6% of the size of the full data in Excel 2010. The file opens in four seconds, compared to more than a minute in Excel 2010.

The PowerPivot version of my analysis workbook behaves flawlessly, never freezing or complaining that it’s “running out of resources”, but there is one fly in the ointment. The customer in question is still running Office 2010, and the Excel 2013 version of PowerPivot isn’t compatible with the 2010 version. If I’m to share my results with the customer in an editable format, I’ll have to convince them to upgrade to Office 2013. That’s no small task, since they didn’t buy Office through Volume Licensing with Software Assurance, so they’d have to fork out the whole sum to upgrade. Hey ho, off I go – to revive my 2010 workstation and re-do the analysis in Excel 2010 using the 2010 PowerPivot add-in. I’m glad I preserved my old setup as a virtual PC so I can always get back to it quickly. ■





Windows Blue

JON HONEYBALL IS EXCITED AT THE PROSPECT OF MICROSOFT'S CLIMBDOWN OVER WINDOWS 8, BUT IS FRUSTRATED BY SLOW UPGRADES ON OFFICE 365

I tried really hard to find a way to spin the lyrics from Joni Mitchell's utterly magical song "Blue" into a title for this column, about the forthcoming climbdown (I'm sorry, I mean "update") over Windows 8. The closest I could get was to employ its closing line: "Blue, here is a shell for you, inside you'll hear a sigh, a foggy lullaby, there is your song from me". This kind of works - so long as you don't mind a touch of kitsch - because the Windows desktop is indeed no more than a shell, and one that has caused no end of sighing to no end of people... and, alright, I'll stop there.

There's an ominous mumbling on the street from those spot-cream-covered teens who chase down beta builds. And before they take that as too strong an insult, let me hastily add that I too used to engage in endless beta programs for Microsoft, before I got older, got a life and discovered the inescapable truth that the only thing that matters in the real world is the final shipping code. I've wasted far too much precious time tinkering with half-baked code snippets that

represent a really clever underlying idea, only to be left in the lurch - like the abandoned bride at the altar - when all that cleverness fails to make it into the shrink-wrap.

All that said, news on the street about Blue is just too delicious to ignore. You see, it seems that Microsoft has decided that what Windows 8 desktop really needs is a Start button. Who'd have thought it? It's almost as though Steve Ballmer realised some time last summer that it was too late to fix this mess, and hence decided to allow Sinofsky enough rope with which to hang himself. And now the Windows team has been instructed - from on high, so I'm told - to sort out this mess and make Windows 8 into something that any God-fearing, righteous Windows 7 user might actually permit to run on their PC. You know the sort, all those business customers out there who have desktop computers rather than tablets, and who contribute most of Microsoft's profits...

This might sound as though it signals the end of the line for my favourite add-on Start8 from



It will become easier to move mainstream Windows users up to Windows 8 after all



Stardock, or its many competitors, but I doubt that - if past climbdowns by Microsoft are anything to go by, this one will be grudging and yield only just enough ground to meet the demand. There will remain plenty of room for Start8 and its ilk to add value into the future. But if not, I don't care, because it's cost mere pennies and has transformed my Windows 8 desktop experience from misery to a pleasure for these few crucial months.

But do be careful with your words: Blue isn't a product. Oh dear no, that would be far too easy. Frank X Shaw, corporate vice president of corporate communications at Microsoft, says: "With a remarkable foundation of products in market and a clear view of how we will evolve the company, product leaders across Microsoft are working together on plans to advance our devices and services, a set of plans referred to internally as Blue." That's as masterful an example of pure PR spin as ever I saw, painting Blue as being more of a tint or flavour than a product launch. Different divisions might even be allowed to choose their own Pantone number to represent their particular shade of Blueness.

Nevertheless, let's ignore all the hype and leaked screenshots - if Microsoft bows to public pressure and recognises the same user interface can't be scaled all the way from a tablet to a multiscreen desktop computer, then progress will have been made, and it will become easier to move mainstream Windows computer users up to Windows 8 after all.

OFFICE 365 DELAYS

I've said it before and I'll say it again, I really like Office 365, especially in its E3 Enterprise guise. With the E3 version, you get all the functionality you'd normally have if you had a large team of IT experts and your own data centre, yet you can sign on with as few accounts as can be counted on the thumbs of one hand. At my

office we have only four accounts, which costs me the grand sum of \$30 per month per seat, and for that we get everything we need for hosted Exchange, SharePoint, Lync, voice integration, 25GB of storage space per user in Exchange, and 7GB of SkyDrive Pro each, too. And it all just works.

For many years, I ran with my own internal server architecture to provide all of this functionality and it worked. In a world where external connectivity was still more of a prayer than a reality, it was the best solution for then. But today, I wouldn't give locally hosted Exchange Server a second glance. If you already have it in place, then use the Office 365 tools to migrate your users onto the hosted cloud solution. Can I be clearer than that? It's simply a no-brainer. However, what is utterly brainless is the way that Microsoft is handling the Office 2013 upgrade path to Office 365.

If you sign up as a new account, you receive access to the Office 2013 code right away, and to the new management portal too, apparently. The licence for Office allows for up to five PCs or Macs per user, and it's Office 2010 (or 2011 for Mac) under the old regime. However, if like me you're a paying customer, then you'll need to wait for Microsoft to upgrade you, and when and where this will happen is anyone's guess. An email went out saying only that it would happen sometime in 2013. Wow, I mean gee and gosh, that really isn't very quick Batman. I understand that Microsoft wishes to migrate people in a managed fashion, not to just press the big green Go button one Friday evening before

▲ Office 365 is a fantastic product, but Microsoft's slow upgrade policy makes no sense



JON HONEYBALL

Computer journalist and consultant specialising in both client/server and office automation applications.

retiring to a local microbrewery for some beverages. And I also understand why some very large organisations would insist on being involved in the migration process, so they can schedule it at a time that isn't too disruptive to their routines. But for the rest of us, please just flip the switch. It will work just fine, and if it doesn't, roll us back to the pre-upgrade version.

I'm particularly peeved because we have those Office 2013 licences today - we're paying for them already - but there's no way to get to the software features through the proper channels. So I went on a hunt and found a document on the Microsoft website that told me how to get the post-upgrade features on a pre-upgrade account. It's actually remarkably simple, assuming you're willing to wrap your head around the utter stupidity of it.

Go to the Office site and download the Enterprise version of Office 2013 Trial edition. Install that onto your machine, and when it starts up, give it the Office 365 login details for the account you want to use. This will then authenticate against the Office 365 servers, which will be happy with the information provided and will authorise you appropriately. You're then up and running. All this could have been avoided for the sake of merely slapping the right download links onto the Office 365 management page, but no, we have to wait like patient schoolchildren before the paternal Microsoft deigns to give us the clickable tools to get the product licences we're paying for. And Microsoft is in no rush - this doesn't impact on sales, since the company

already has our cash. Why should it make this happen anytime soon? It isn't like we're going away, we love the product. Deep sighs all round.

INSTRUMENTATION CONTROL

There's no reason why you should know this, but my real day job is running a product-testing lab. We look at all sorts of products from computer- and audio-related fields, including hardware, software and so forth, and we've built up an expertise over several decades in understanding what makes such stuff work well, awkwardly, or just be a royal pain in the neck. Part of our work involves very detailed and deep hardware and software testing, using some very expensive test equipment.

Recently, I decided it was time to upgrade our audio-analysis tools. A typical analyser will contain signal generators that can produce all kinds of noise and tone bursts and sweeps, together with analysis engines that can extract detailed data using technologies such as fast Fourier transforms (FFT). In the modern era, it isn't enough to do this analysis only in analogue: we need to test digital bit streams, too, from protocols such as the simple S/PDIF digital interface found on many computers and domestic hi-fi gear, through to more exotic interfaces such as I2C and AES/EBU. We also need special kit to accurately measure something such as a Bluetooth earpiece.

Anyway, back in January I visited the Consumer Electronics Show (CES), where I quite unexpectedly bumped into Prism Sound. After a few minutes chatting, it became clear that I knew the company well through its Sadie digital audio workstation system. The company's top-flight audio-test system, called dScope, did everything I could possibly want, and on every interface, too. I accept that it isn't what you might consider bargain-basement cheap, coming in at more than \$10,000, but Moore's law applies here with a vengeance - that's pitifully cheap compared to the analogue test equipment of ten years ago, and laughable compared to prices of 20 years ago (and for kit that did vastly less).

Integral to the way that dScope works is that all its clever electronic circuitry lives inside a properly screened external box, which is then connected to a PC via USB cable. Here, all the UI stuff is performed within a Windows app that's supplied with the box. It's a stunning piece of work

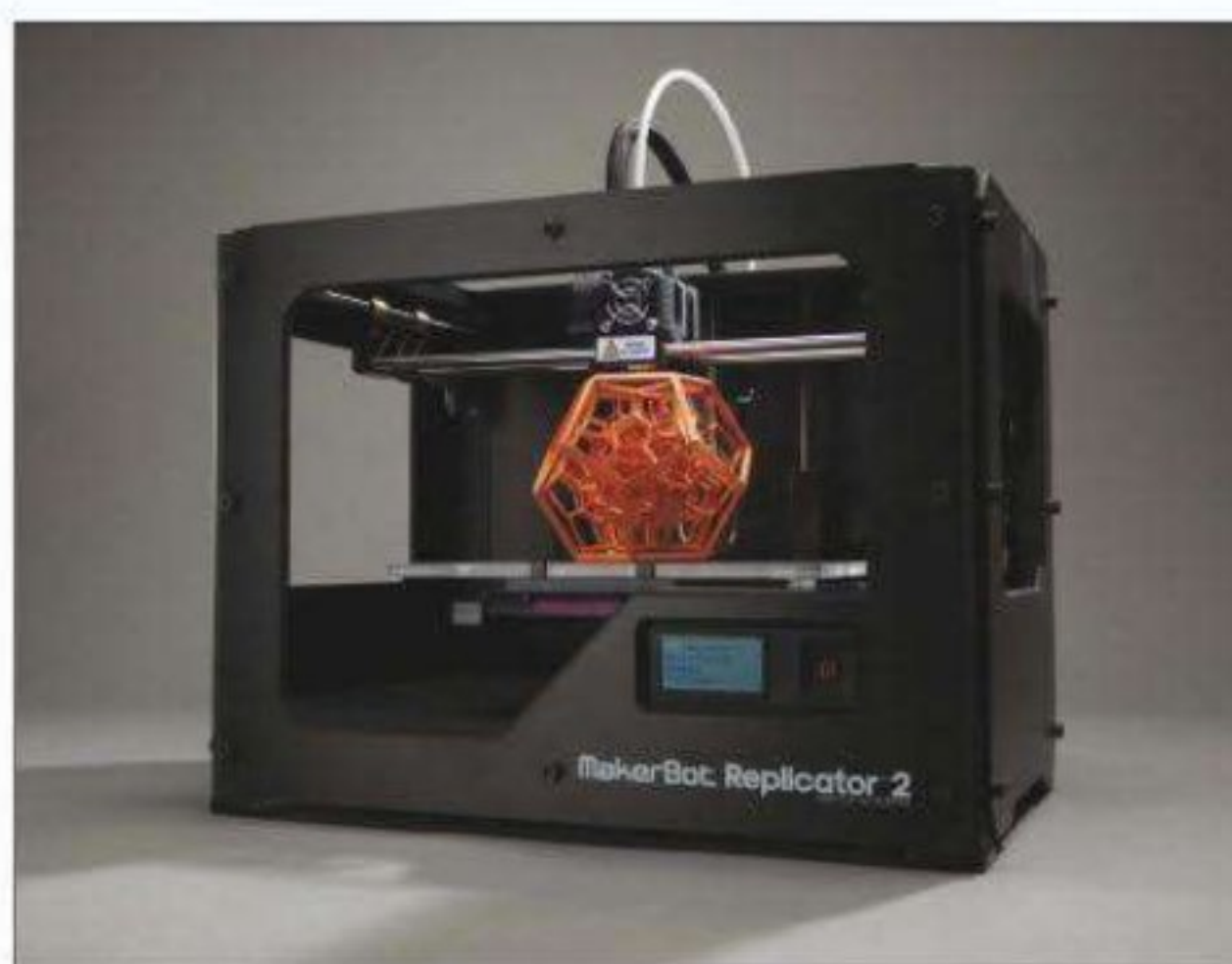
that offers an extraordinary amount of power and capability, along with full real-time automation. There are a couple of bugs under Windows 8 64-bit that we're discussing with Prism Sound, and I'm going to make sure it keeps up to date on all future OS-compatibility issues. For us this is a major purchase, with a 15-year working lifespan (even though the tax man will let us write it off over a far shorter period). Because of that, software support will become a key issue in keeping it at the leading edge. Bravo to engineers to have come up with some kit that rivals the best in the world.

And while we're talking about Windows support, I notice that some very sexy oscilloscopes from Tektronix now actually have a complete Windows PC built into them, and their whole UI is written as an app running on Windows 7 64-bit. So imagine my surprise to read this in a software-upgrade readme file: "If you connect this instrument to a network, we highly recommend that you install antivirus software. Prior to leaving Tektronix, this instrument was verified clean of known viruses." Surely this is a case where you ought to treat such an expensive and trusted piece of equipment to its own VLAN, with hardened protection at the firewalls?

I'm not sure I'd want to put any antivirus package onto a scope costing tens of thousands of pounds, which I'd want to keep as close to Tektronix's default configuration as possible. Otherwise what would you do if something went wrong? Was it the scope hardware? Or its software? Or a dodgy antivirus package you've loaded onto it? Exactly the same principle applies to medical equipment and other such specialist devices: unfortunately, these far too often get stuck onto a standard network without any consideration for VLAN isolation and separation, and this really isn't good enough.

MICROSOFT SURFACE PRO

By the time you read this, Microsoft might well have finally got around



▲ Using my 3D printer is time-consuming at present, but the software will get better

to releasing Surface Pro into the Australian market. According to a posting by Brian Hall, general manager of the Microsoft Surface group: "Surface Pro will launch before the end of May in Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Italy, Luxembourg, New Zealand, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. Surface Pro will launch in Korea, Malaysia, Russia, Singapore, and Thailand before the end of June."

To be honest, I'd forgotten that Surface Pro wasn't actually for sale here. It's interesting enough, but it has many significant limitations. Given that it was launched many months ago now, and that the average lifespan of a laptop or tablet nowadays is 16-18 weeks, buying a "new" Surface Pro today would somehow feel like buying yesterday's goods (and it's reviewed this issue -ed).

Maybe I'm just being unfair, but I was left feeling lukewarm by Surface Pro. Admittedly, though, that's considerably better than the Surface RT, which still leaves me feeling distinctly chilly - a weak OS port, a miserable desktop experience, and woefully restricted Office apps are countered only by its good battery life. Surface Pro can't even offer the decent battery life, although it does offer a better Office experience.

MAKERBOT REPLICATOR 2

As I'm typing this, I'm making a

new teapot. Well actually I'm not, it's my MakerBot Replicator 2 that's currently 3D printing a teapot for me. It will be bright red, with a proper removable lid and pouring spout. It isn't a quick process: so far it's taken about eight hours to complete about 25% of the pot - I hope it will be ready for my early morning Earl Grey tomorrow.

It isn't only the printing that's slow. Generating the data file that drives the printer took more than an hour of computation. I realise there's a huge amount of computational effort involved in taking a 3D model, slicing it up into individual layers 0.1mm thick, designing internal structures to add strength, then calculating an optimum path for the print head to follow. All of this is CPU-intensive, but it appears that much of it is performed in Python, and it barely taxes the computer when it's doing the big calculations. Maybe I should try upgrading the default Python engine to a just-in-time (JIT) compiled version - some people are claiming a doubling of speed from doing so, which would be useful.

I'm thrilled with 3D printing, although it's very pre-beta and hair-shirtish at present. Many attempts go wrong for a variety of reasons. I've had blocked nozzles, printing surface plates that aren't exactly level and have to be adjusted manually, right through to weird software crashes and unexplained disconnections. It's heartbreaking to see six hours of work ruined in the last half hour because of problems such as these: unlike a software crash, it isn't merely a matter of restarting, it's throwing away the heap of wasted plastic. But these are very early days, and the software will get better. ■

▼ Prism Sound's audio-test system, dScope, is a stunning piece of hardware



COOKIES

There's an impressive ecosystem building up around 3D-printing devices, not only for Windows but on Mac OS X and iOS, too, with some impressive players such as Autodesk starting to dip in its oars. The printers are still a little too expensive to buy at the moment, but they're about to explode into the school and college market, along with small engineering shops and hobbyists, too. I've just discovered someone selling Dr Who cookie-cutters made on their 3D printer (I may be some time...).

Which cloud can you trust

FIONA TEAKLE LOOKS AT THE CONTINUING EXPANSION OF CLOUD COMPUTING, AND ITS FUTURE.

Sydney recently played host to CEBIT - Australia's largest annual business technology conference. While each CEBIT has a large trade exhibition showcasing the upcoming technology, and provides delegates a chance to meet and play, there is also an extensive conference held throughout the three days. One of the conference streams this year was focused on the cloud and the issues companies are facing when utilising cloud computing technology.

Everyone seems to have their own definition of cloud computing; at its core, however, most people will agree that cloud computing provides IT flexibility through a series of automation and standardisation techniques of traditional IT services. This allows a faster time to market, lower cost of ownership and reduced operating cost. Cloud computing comes in a variety of flavours, from personal-use cloud services to Enterprise IT systems.

Cloud computing continues to expand as people are starting to realise the benefits. Recent IDC research shows that worldwide spending on cloud services will grow from current levels by almost threefold, reaching \$44.2 billion by the end of 2013.

One of the benefits of the Cloud is the ability to achieve economies of scale. While for a large company this offers a chance to grow with less cost, for small to medium companies this provides an opportunity to play on the scale of a large company - so only paying for what they are using as a service rather than the hardware costs and everything else that comes along with maintaining the hardware. This means that they can have the most up to date technology and speeds without the capital overhead, which they may not be able to afford.

As we become more and more



One of the benefits of the cloud is the ability to achieve economies of scale.



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dependent on technology to run not only our businesses but the world, there is an increased focus on Disaster Recovery. Being part of a cloud environment may provide an extra level of redundancy, generally both inside the main data centre where the environment is hosted and within an extra DR site. This means that if something were to happen to part of the cloud, such as hardware failure, then the environment can move around with minimal impact to the business.

While cloud computing has many benefits, there are always two sides that need to be taken into consideration. The biggest risk and concern for using the cloud is around security. If the data is being stored in a shared environment, somewhere in the world, how safe is it? Caution should be taken as to what type of data we are willing to store in a shared environment. Having said that, most of the companies selling a cloud solution have the most up to date security measures in place, though this doesn't mean we should not be thinking before acting.

Another factor which needs to be considered is where your data/application/service is being physically kept and any additional legal requirements that may come with it. Many jurisdictions have strict regulations on the transfer and storage of data, especially personal or private data. Within Australia this is an issue, as many providers will base their clouds overseas due to cost. If the data is stored offshore, how can you be sure that it is being protected in accordance with Australian standards and

laws? Companies choosing to turn to a cloud solution need to ensure they have performed the correct research on the company they are using. New Zealand appears to be leading the way with this at the moment, in producing the "New Zealand Cloud Computing Code of Practice". This provides standards to help protect the reputation of those providing professional services within the cloud computing industry as well as helping to define what good practice should look like in New Zealand.

The future of cloud computing will focus more on providing customers with Applications as Services, which is noticeable now for SAP and Microsoft solutions. This will provide a platform for new applications to reach the market faster and increase capacity requirements based on demand in a fast and efficient way.

The federal government has just announced a National Strategy for Cloud Computing. The strategy outlines the government's vision for using cloud to enable innovation and productivity across the digital economy. The ACS believes that this will only help the ICT industry within Australia and allow us to continue to grow. Taking a leading role in developing protocols that will promote trust and transparency will only help drive the uptake of cloud among business and consumers.

The innovation and creativity that will be available to small to medium and not-for-profit companies via the cloud offerings is only going to benefit the world in the long term. I personally can't wait to see what will be achieved by utilising this!



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What to do with an 18in tablet?

JON HONEYBALL cooks up an idea

“ There really isn't much to get excited about with laptops and tablets any more. It seems most laptops and Ultrabooks are cut from the same cloth, with small changes differentiating a rather large set of choices. Whether it's touchscreen or not seems to be the “made for 2013” tickbox.

In the tablet space, you have the market-dominating iPad family, with Android devices going along for the ride. Then there are Windows 8 tablets from a variety of manufacturers, with the Microsoft Surface being the elephant in the room.

So, you can imagine my delight at hearing the news that some vendors are launching larger devices: some 12in, a few even bigger. When I saw Dell had launched the 18in XPS 18, I went straight to the website and placed an order for next-day delivery.

This thing is huge. An 18in tablet screen is, in some ways, a thing of beauty. If you sit it in the supplied desktop stand, you can see it from the other side of the kitchen, which I guess is where it will primarily be used. Do you want to keep an eye on Twitter while kneading bread? Not a problem. Want to watch the football while cleaning the oven? Again, that isn't an issue.

It sits reasonably well on your lap, too, and doesn't suffer from the falling-down-the-gap-in-the-middle effect that plagues smaller tablets; it will rest just fine across both your knees. It would be a joy to use on a plane, assuming you have enough distance between you and the seat in front, and an adequately sized tray – think more business class than

economy. Bear in mind that it's only slightly smaller than the 20in Sony Trinitron TV my parents bought in the 1970s, which was deemed suitable for family viewing (in colour, no less).

So, apart from watching TV and keeping an eye on Twitter across the room, to what other uses can you put an 18in tablet? Well, to be honest, I had hoped there would be a real revolution of thinking. For example, wouldn't it be great if you could pick up a streaming video feed and drop it onto your tablet, then change rooms and push it back to the big TV? Or if you could run lots of applets at the same time, keeping an eye on everything from Twitter to the baby cam?

Yes, all that would be nice. But it's here that cold, hard reality hits. Lest we forget, the XPS 18 employs Windows 8, so it suffers from all the problems relating to that OS. Yes, I can snap two Metro apps onto the screen – but only two. On a screen of this size, I want eight. Even if I could run that number of apps, I'd soon run into the resolution limit of the screen: at only 1920 x 1080, the display looks pixellated even from a few feet away. I'm not convinced it would work well with eight information windows open at once.

Next, there's the weight. It's made from concrete, or at least that's what it feels like. You can forget holding the XPS 18 in one hand – that simply isn't going to work. Also, the width makes it awkward to thumb-type on the keyboard. My hands aren't small, but there's a huge gap in the middle, even with both hands outstretched. Sitting the device on your lap or on a table are the only

options. So, we're back to kitchen mode, since it really doesn't offer anything useful outside this space.

It's all a little disappointing. You can't simply scale up a product without giving it specific capabilities that take advantage of the increased size. Otherwise, you end up with something as pig-ugly as the oversized Mini Countryman, for example, which looks like a Mini that's been over-inflated by an air line at a garage.

And then it dawned on me. I was carrying the XPS 18 across the room by holding it on either side, as I would a medium-sized tray topped

“Bear in mind that it's only slightly smaller than the 20in Sony Trinitron TV my parents bought in the 1970s”

with a dinner plate and a glass. Dinner would obscure some of the screen, of course, but would that really matter? Clearly, this is an area Dell needs to investigate further for the XPS 18 Mark 2. It already has decent rubberised feet, which prevent it from sliding around; with a little more research in this direction, its transformation into a useful device would be complete.

Except for one thing, something so blindingly obvious when you think about it that I can't believe Dell missed it: the XPS 18 needs cute little handles on each side to make it easier to carry. Then you could have advertising beneath your beef stroganoff as well as on the television screen. Perfect.



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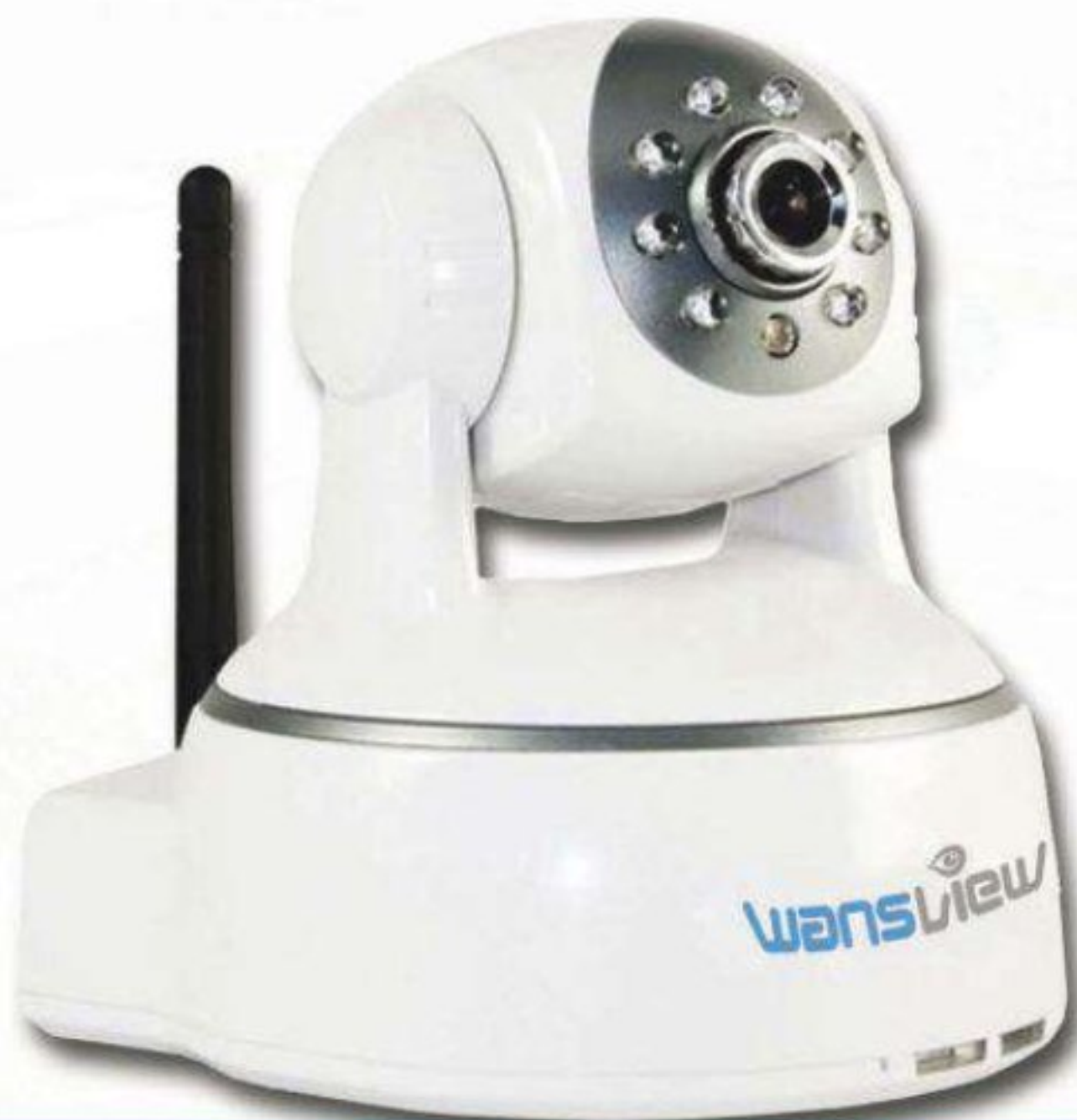


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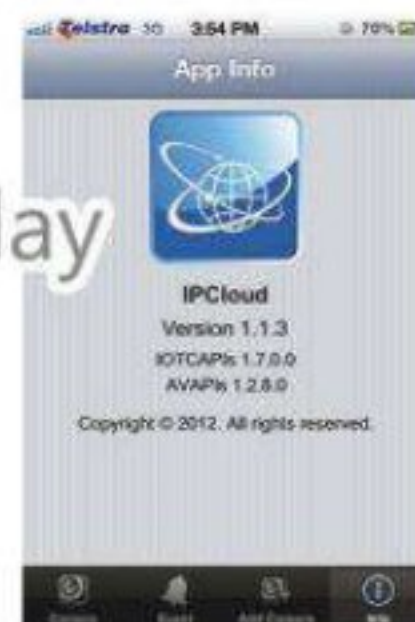


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