

PC & TECH AUTHORITY

TECH ADVICE YOU CAN TRUST

OFFICE SUITE ROUNDUP

ARE PAID
SOLUTIONS
BETTER?



UNDERSTANDING MOBILE DATA



SURF
SMARTER AND
SAVE MONEY!

ULTIMATE ANTIVIRUS ROUNDUP

ANTI-VIRUS SOFTWARE FROM MCAFFEE, TREND
MICRO, SYMANTEC AND MORE COMPARED – WE
FIND THE BEST FOR PC AND ANDROID!



THE ULTIMATE GUIDE TO HOME NETWORKING



FIND OUT WHAT YOU NEED
TO GET YOUR HOME & DEVICES
CONNECTED!



DAYZ
STANDALONE
THE BEST ALPHA
YOU'LL EVER PLAY

REVIEWS

CORSAIR
OBSIDIAN 250D,
LENOVO YOGA
TABLET 8, HTC
ONE MAX,
ASROCK
FATALITY Z87
KILLER AND MORE!



TP-LINK®

The Reliable Choice



Make me fly

Wireless Dual Band Gigabit ADSL2+ Modem Router

AC 1750 *Archer D7*

**Please visit the website for more information*

TP-LINK Australia Pty. Ltd

www.tp-link.com.au/



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



WHERE ARE THE SURPRISES?

In many ways the start to 2014 for tech has been a fascinating, and slightly worrying snapshot of the current state of the technology industry, one in which there seems to be very little setting the mind alight with possibilities. Our very real worry is that we are starting to feel the impact of the passing of Steve Jobs in 2012, where an industry without a figurehead is scared of innovation.

The major trends of CES lacked any real bite. Various flailing attempts to snatch the wearables market were met with yawns (seriously, after centuries of design you'd think someone would know how to put technology in a freaking watch without making it look like something rejected from a childrens showbag). Besides that we had cheaper 4K screens, Intel's curious Edison concept and Valve Software starting its big Steam Machine push. All interesting but nothing breathtaking or truly exciting.

This month we've taken advantage of the product lull to focus on software, with our Antivirus roundup, Home Networking guide and a look at whether you should buy, subscribe or get a free office package.

We've also looked at what we consider to be the finest Mini-ITX case yet made, Corsair's Obsidian 250D. That alone has meant we aren't completely despairing for the industry, just a little disappointed in what we saw come out of CES.

John Gillooly

[E jgillooly@nextmedia.com.au](mailto:jgillooly@nextmedia.com.au)

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>



THE TEAM...



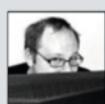
Managing Editor

David Hollingworth

[E dhollingworth@nextmedia.com.au](mailto:dhollingworth@nextmedia.com.au)

[T @atomicmpc](https://twitter.com/atomicmpc)

The view of Sydney skyline from our new office makes it really hard to concen... ooh a helicopter! .



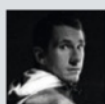
Video Producer

Josh Lundberg

[E jlundberg@nextmedia.com.au](mailto:jlundberg@nextmedia.com.au)

[T @MrJosh86](https://twitter.com/MrJosh86)

I worry that installing Hearts of Iron 3 means my Kerbals will be destined to a life of floating in near earth orbit.



Art Director

David West

This is last issue of my guest stint designing PC&TA. At least I no longer need to wear pants to work.

CONTACT US...

Call us

(02) 9901 6100

E-mail us

inbox@pcandtechauthority.com.au



Facebook

www.facebook.com/pcandtechauthority



Twitter

[@pctechauthority](https://twitter.com/pctechauthority)

FATAL1TY[™] ASRock[®]

ceBIT
Welcome to
ASRock **ASRock**
Rund
Hall 2, C55
10 - 14 March, 2014



B85 KILLER

Z87 KILLER

990FX KILLER

FM2A88X+ KILLER

KILLER

**GAMING
SERIES
MOTHERBOARDS**

NO LAG, JUST FRAG!

**Killer[™]
E2200**
GAME NETWORKING

5X
Networking Performance



www.asrock.com | www.fatal1ty.com

The specification is subject to change without notice.
The brand and product names are trademarks of their respective companies.
Any configuration other than original product specification is not guaranteed.

ALTECH
COMPUTERS
www.altech.com.au

ACHIEVA
GROUP OF COMPANIES
www.achieva.com.au

NSW
ARC Computers
Aus PC Market
Capital Computer
Libby
LJK
Megaware Computer
MSY
miWave
Nexcom
North Shore Computers
PC Lan
PC Med
D & D COMPUTER TECH.
DIY COMPUTERS
MAIG PTY LTD.
J&W
02 9748 8322
02 9648 8000
02 9281 8800
02 9099 0888
02 9745 0877
02 9688 1693
02 8755 0888
1300 727 446
02 4721 3457
02 9839 1548
02 9648 3288
02 9748 7688
02 9807 9993
02 9648 2281
02 8090 3332
arc.com.au
auspc.com.au
capitalcomputer.com.au
libby.com.au
ljk.com.au
megaware.com.au
msy.com.au
miwave.com.au
nexcom.com.au
northshorecomputers.com.au
pclan.com.au
pcmed.com.au
ddcomputer.com.au
diycomputers.com.au
mailg.com.au
jw.com.au

QLD
Computer Alliance Pty Ltd
Game Dude Pty Ltd
MSY
Smart Online
AUSCOMP COMPUTERS
VIC
Computers & Parts Land
MSY Technology
PC Case Gear
Centre Com Runline PTY
Scorpion Tech. Computers
NT
PC Solutions 4 U
TAS
Principal Computers
07 3420 3200
07 3387 1500
07 3280 1738
07 3388 3828
07 3722 5100
03 8542 8888
03 9560 2288
03 9551 9889
03 8311 7600
03 8581 3200
08 85412119
03 8235 5000
computeralliance.com.au
gamedude.com.au
msy.com.au
smart1.com.au
auscompcomputers.com
cpl.net.au
msy.com.au
pccasegear.com
centrecom.com.au
scorpiontec.com.au
pcsolution4u.com.au
tasmanianpc.com.au

WA
Austin Computer
MSY
Netway Computers
Netplus Micro Computers
PC West
PLE Computers
Worthington Net Solutions
ARROW COMPUTERS
SA
Hypernet Computer Distribution
MATS Systems
MSY Technology (SA) Pty Ltd
IT&Computers
Photach Computers Pty Ltd
08 9201 2788
08 9344 1052
08 9532 0888
08 9242 7288
08 6388 4813
08 9309 4771
08 8375 9888
08 9258 7733
austin.net.au
msy.com.au
netwaycomputers.com
netplus.com.au
pwest.com.au
ple.com.au
netsolution.com.au
arrowcomputers.com.au
08 8348 2021
08 8188 2110
08 8212 1888
08 8188 2736
08 8349 4334
hypernetdist.com.au
mats-systems.com.au
msy.com.au
itwarehouse.com.au
photach.com.au



INBOX

IF YOU HAVE A STORY OR POINT TO MAKE, SEND IT IN! TELL US YOUR ANECDOTES, OPINIONS & TALES OF WOE



Getting in touch

MAIL

Inbox, Level 6, Building A, 207 Pacific Highway, St Leonards NSW 2065

WEB

pcandtechauthority.com.au

EMAIL

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

share households or people with big families can really make a lot of use of extra screens, and not everyone dislikes watching films and television on their tablets, or even their mobiles. Nearly every time I travel to and from work, I see people watching all kinds of shows on all kinds of devices. Personally I keep a copy of Inception on my iPad – sourced via the free digital copy that came on my Blu-ray.

STICK THIS

I was wondering why you don't put your software, games etc on a USB stick, instead of a DVD? I don't have a CD/DVD drive, so I can't install any of the software that comes on the DVD. These days everyone uses USB, and you can buy USB sticks in bulk on amazon for cheap.

J. Niesler

John Gillooly says: That's a good question! USB sticks are definitely handy, and becoming seriously cheap. We actually get press materials at events on USB more often than not, meaning we're kind of inundated with them. Including them regularly in a magazine, however, is a bit more costly, as it changes the thickness of the publication, which in turn makes postage to our subscribers more expensive. The humble DVD is still more useful in that regard!

ONLINE ISSUES

Hi, big fan of your web site and magazine, but any chance of stopping those stupid "More in (insert ATOMIC etc.)" pop ups that really detract from using your website.

A. Ryan

John Gillooly says: We're not fond of them either – we'll do our best.



LETTER OF THE MONTH

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

TOP SITE COMMENTS

One more reason to completely cut the power to your PC when you're done with it.

Duper on NSA snooping
Web ID: 369702

Why can't Samsung develop a tablet without it resembling another brand? I would have thought they have come far enough to want their product to be totally of their own design.
slgrotty doesn't think much of Samsung's tablet design
Web ID: 369393

I was unsurprisingly disappointed.
Ekythump's opinion on Call of Duty: Ghosts
Web ID: 369707

Whilst I do love Billion routers and shudder whenever I have to configure a different brand, their hardware has been continuously 6 months behind for too many years.
nevetsg still likes them, though
Web ID: 369612

Woah. Looks like I got my first "Added Me Back" message today. Interesting 'cause I've never added anyone.
rogue316 on the mysteries of Google+
Web ID: 369383

This controller frightens me – help...
savvart is unsure about the new Steam Controller
Web ID: 368950

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

I was bemused to read about all the half-baked ideas for watching movies on small screens "around the home"! Why bother, when there is a nice large TV screen in the lounge? Attached is a 1TB PVR that can pause and rewind live television. If I really like an old movie (out of copyright) then I can record either direct from the TV to external hard drive, or on my computer via twin a TV tuner card. I can then copy the movie to a tiny 320GB external USB-powered hard drive to watch anywhere. I usually take a 10in netbook with a 250GB hard drive plus the 320GB external drive if I travel overseas. I have no interest in watching a movie on a 5in or smaller phone screen. Tablets are all very well, but for movies the limited storage and connectivity means the netbook is still the way to take your movie collection with you. I could take my Android tablet with micro to USB adapter and plug in a 32GB USB stick. I could carry ten of these to get the same storage. I could get a Windows tablet which might run the 320GB hard drive. But why should I bother when the netbook with external DVD writer and hard drive still does it all?

P. Dawson

David Hollingworth says: Well, you have a solution that works for you, but just because it does doesn't necessarily make the other options in our feature 'half-baked'. Large

CONTENTS

ISSUE 196
MARCH
2014

FEATURES

THE ULTIMATE GUIDE TO HOME NETWORKING

We dig into the dos and don'ts, the tips and tricks and the gear you need to make the most out of a home network.....18

OFFICE – RENT? BUY? DUMP?

Is the traditional Microsoft Office needed anymore? We look at your options, from free and paid online packages to free downloadable alternatives.....26

BLOCK PARTY

A look at how the hit game Minecraft is capturing the minds of both kids and educators the world over, and delivering some surprising results.40

TECHDESK

INBOX

Your letters answered.....5

PRODUCTS & TRENDS

All the technology and gaming news that's fit to print 8

INVESTIGATOR

Essential consumer advice.....16

HOW TO

SYSTEM BUILDER

How to properly prepare an old PC for disposal or sale without leaking personal data..... 84

HOW TO: MANAGE MOBILE DATA

How to ensure that you don't go over the data allowance on your mobile plan..... 88

HOW TO: HOW MUCH RAM?

How much RAM is really enough nowadays92



FEATURE:
HOME
NETWORKING
18



FEATURE:
OFFICE
26



FEATURE:
MINECRAFT
40



DVD CONTENTS

This month's disc comes with a great VPN app to let you surf securely 98

SUBSCRIBE & SAVE!

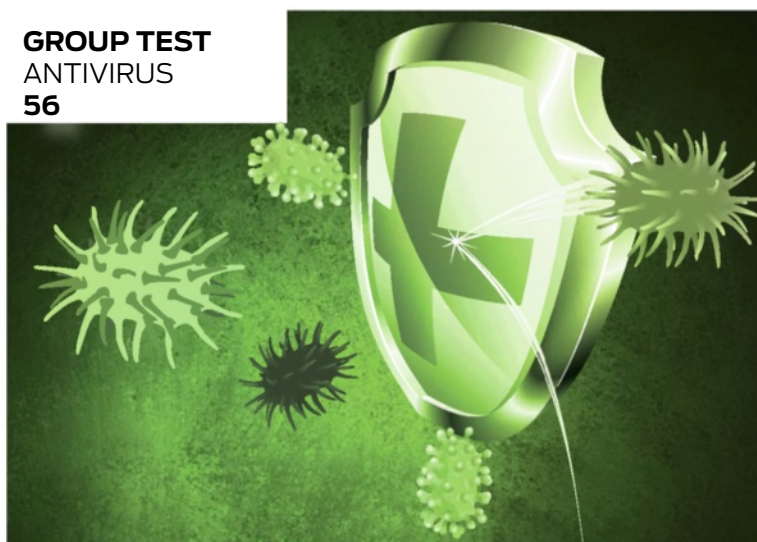
Get PC & Tech Authority delivered! Page 80





REVIEW
CORSAIR 250D
48

GROUP TEST ANTIVIRUS 56



REVIEWED THIS ISSUE...

■ PERIPHERALS

Bitfenix flo.....	54
Microsoft Wireless Mobile 3500 Mouse	54
Steelseries Stratus.....	55

■ COMPONENTS

Corsair Obsidian 250D	48
Asrock Fatalty Z87 Killer	54
Corsair Hydro H105	54

■ SOFTWARE

Steinberg Cubase 7.5.....	51
Inkredible.....	52
Choicemap.....	52
Pandora Internet Music Radio.....	53
Quit your job	53
1stAvailable	53
Confide	53
Avast Free Antivirus 2014.....	60
Eset Smart Security 7.....	61

Kaspersky Internet Security 2014.....	64
Norton Internet Security	66
AVG AntiVirus Free 2014.....	67
Bitdefender Internet Security 2014.....	67
McAfee Internet Security 2014.....	68
Microsoft Windows Defender.....	68
Trend Micro Titanium Internet Security 2014.....	69
Norton Mobile Security.....	62
Eset Mobile Security & Antivirus ..	63
Qihoo 360 Mobile Security	63
Trend Micro Mobile Security & Antivirus	63

■ GAMES

DayZ Early Access	72
-------------------------	----

■ HANDHELDS

HTC One MAX.....	46
Nokia Lumia 1520.....	47
Lenovo Yoga Tablet 8	55



REVIEW
PANASONIC LUMIX DMC-GM1 50

■ REAL WORLD COMPUTING

SECURITY

Social (networking) security	95
------------------------------------	----

IO

Our in-depth question & answer section	100
--	-----

WEB APPS

Getting it done	102
-----------------------	-----

WINDOWS

What is the OS doing right?	105
-----------------------------------	-----

■ THE A-LIST

Only the best of the best make it to

PC & Tech Authority's A-List	76
------------------------------------	----

■ EPILOG

Jon Honeyball thinks things are never SIMPLE.....	114
---	-----



TECH NEWS

LATEST TRENDS AND PRODUCTS IN THE WORLD OF TECHNOLOGY

AMD RELEASE NEW A-SERIES APUS

THREE NEW ACCELERATED PROCESSING UNITS HIT THE MARKET FOR POWER-CONSCIOUS BUILDERS

AMD is sounding very bullish - as well it should - about its new A-series accelerated processing units. Packed with 'Kaveri' Radeon R7 graphics, the new APUs "deliver superior compute and heart-pounding gaming performance".

Other features in the A-series FM2+ form factor include up to 12 cores total (4 CPU and 8 GPU - ZOMG!), and Heterogeneous System Architecture to help deliver the right tasks

to the appropriate processing element. Also onboard is Graphics Core Next (GCN) Architecture with DirectX 11.2 support, the much awaited/debated Mantle API, and AMD TrueAudio and support for UltraHD resolutions - so you can watch the handful of limited and rather poor 4K content on the market.

Here's the full specs of the three new APUs.

MODEL	AMD A10-7850K WITH RADEON™ R7 GRAPHICS	AMD A10-7700K WITH RADEON™ R7 GRAPHICS	AMD A8-7600 WITH RADEON™ R7 GRAPHICS
Power	95W	95W	65W/45W
Compute Cores	12	10	10
CPU Cores	4	4	4
GPU Cores	8	6	6
Max Turbo Core	4.0GHz	3.8GHz	3.8/3.3GHz
Default CPU Frequency	3.7GHz	3.4GHz	3.3/3.1GHz
GPU Frequency	720MHz	720MHz	720MHz
L2 Cache	4MB	4MB	4MB

The A10-7850K and A10-7700K are available now and cost an impressive \$219 and \$199 respectively, while the lower-

spec'd A8-7600 is coming this quarter with no pricing details. All APUs will also be bundled with Battlefield 4.



HACKING CLAIMS A HOAX, ACCORDING TO DROPBOX

CLOUD STORAGE FIRM SAYS ROUTINE MAINTENANCE CAUSED RECENT OUTAGE

Dropbox has denied its weekend outage was caused by hackers or a distributed-denial-of-service (DDoS) attack, saying all user data was safe.

The cloud-storage service went offline on Friday evening for three hours, although Dropbox admitted some users saw intermittent issues throughout the weekend.

The service should be fully back up and running for all users, the company said, although it said issues remain with the Dropbox photos tab.

At the time of the outage, hacking groups Anonymous and 1775 Sec both claimed responsibility, with reports suggesting the attack was somehow connected to the anniversary of the death of internet activist Aaron Swartz.

However, Dropbox said reports of a hack were a "hoax", and the real cause was an OS upgrade to some servers. "Unfortunately, a bug installed this upgrade on several active servers, which brought down the entire service," said Aditya Agarwal, vice-president of engineering, in a post on the Dropbox blog. "Your files were always safe, and despite some reports, no hacking or DDoS attack was involved."

Head of infrastructure Akhil Gupta further explained that the upgrade script checks to make sure there's no active data on servers before installing a new OS, but a "subtle bug" led to active machines being reinstalled. "Your files were never at risk during the outage," Dropbox added. "These databases do not contain file data. We use them to provide some of our features (for example, photo album sharing, camera uploads, and some API features)."

Agarwal apologised for the downtime, saying it was "unacceptable", and saying Dropbox was investing in more "tools and checks" to avoid a similar situation in the future, including an additional layer of checks to the state of machines before running updates and a new tool to increase recovery times.

WINDOWS THRESHOLD (8.2): WHAT WE KNOW

WE ROUND UP THE LATEST NEWS ABOUT MICROSOFT'S THRESHOLD UPDATE, DUBBED WINDOWS 9

Microsoft is already planning the next major round of updates to Windows 8 - the follow-up to Windows 8.1, codenamed "Threshold".

Here, we'll track the latest leaks and rumours about the Threshold update, letting you know what to expect from Windows 8.2 - if that's what it's indeed called - when it arrives in early 2015.

NAME AND RELEASE DATES

The next major round of updates to Windows 8 is nicknamed "Threshold", according to Windows watcher Mary Jo Foley, who reports that the codename was mentioned in an internal email from Microsoft's head of OS Terry Myerson.

Despite that nickname, many started referring to the update as Windows 8.2.

This story was updated on 13 January with details of the Threshold unveiling at Build and the reports of dropping the Windows 8 name.

But Microsoft is apparently reluctant

to continue with the Windows 8 branding after its poor reception, instead considering calling the update Windows 9, according to Windows expert Paul Thurrott.

Threshold is expected to arrive in Spring 2015, Foley reported, which would be in keeping with previous reports that the next major OS update wouldn't come until then - which had led many to anticipate the release of Windows 9.

That doesn't mean Microsoft won't be releasing any updates in the coming year. Windows 8.1 Update 1 is expected to arrive in early 2014, alongside an update for Windows Phone 8.1, though this isn't thought to feature any major changes.

And according to Thurrott, Microsoft plans to share its vision for Threshold at the Build conference in April. That won't mean a detailed outline or a developer preview, but a high-level outline.

RETURN OF THE START MENU

Threshold will herald the return of the Start menu, according to Thurrott. The Start menu was controversially removed in Windows 8, and though the Start button returned in Windows 8.1, left-clicking it only returns users to the Metro/Modern UI start screen. Right-clicking the icon does bring up some of the Start menu's shortcuts, but still doesn't offer any way to launch applications within the desktop.

HOT... OR NOT

HOT

STEAM

Valve's game distribution service has topped over 75 million users, once and for all proving that PC gaming is far from dead. And with the service set to include pricing in Aussie dollars this year, it will get even easier to use. Of course, if we get screwed on price, Steam will be Not Hot very fast!



NOT

XMAS ORNAMENTS

Or, more accurately, leaving the office last year before our shiny World of Wargaming Xmas ornaments arrived. They would have been perfect for adding a certain gaming something to our festivities over the break!



The next major update will see the Start menu resurrected - but only in desktop versions of the OS.

DIFFERENT VERSIONS

There will be three major versions of Windows following the Threshold update, according to Foley.

The first is a desktop version, designed to be used with a keyboard and mouse. It will feature the Start menu and may also allow Modern apps to run inside windows like more traditional applications.

The second is a Modern-style edition, focused on apps for tablets, while the third will merge Windows Phone and Windows RT to work across ARM handsets and tablets.

In addition to the consumer versions, there will also be an enterprise edition, but this may only be available via volume licensing.



GAMING NEWS

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

SIMCITY WILL OFFER OFFLINE SINGLEPLAYER AS PART OF NEXT DOWNLOAD

THE GAME THAT WAS NEVER MEANT TO BE SINGLEPLAYER, IS NOW SINGLEPLAYER, AS EVERYONE ACTUALLY ALWAYS WANTED

Remember the HUGE stink about SimCity requiring an always-on internet connection, and how Maxis and EA had always envisaged the game as a multiplayer experience? Remember how it was meant to be just too hard to make the game playable any other way?

Well.

Let's get right to it.

SIMCITY OFFLINE IS COMING!

I've wanted to say those words for quite some time, so my apologies that I didn't take the time to say Happy New Year first.

They're the opening words of a post

from Maxis' Patrick Buechner, the General Manager of Maxis Emeryville. It's from an announcement posted up over night on the game's blog, and while it's possibly maybe sorta good news for SimCity 'fans', it really comes across as more than a little smug.

Regardless, offline singleplayer is coming. 'Shortly' is the only timeframe, but it will allow games to be started and stored purely locally. More importantly, it's also going to open up the game to much deeper modding, which can only be a good thing for the community.

To learn more, check out the post - http://www.simcity.com/en_AU/blog/article/simcity-offline-is-coming-au

2K ANNOUNCES EVOLVE, THE CO-OP GAME OF THE FYOOCHA

IT'S FOUR HUNTERS VERSUS GIANT MONSTERS IN THE LATEST GAME FROM THE CREATORS OF LEFT 4 DEAD.

Turtle Rock Studios know a thing or two about co-op games - you might know a little but about Left 4 Dead, perhaps? Well, the team's not resting on its laurels, and is hoping to push the co-op envelope even further with Evolve, a 2K published shooter action game with an intriguing asymmetrical take on the genre.

Evolve is set in the far future, on a different world, and rather than working on 4v4 co-op, the game pits four human players against a single monster. The humans play in traditional first person shooter mode, while the monster enjoys a third person view - each having different combat mechanics.

The game will be class- & level-based, with a variety of monsters to choose from.

"Our philosophy is to build incredibly fun game experiences that we can't find anywhere else," said Chris Ashton,



co-founder and design director at Turtle Rock Studios, in today's announcement. "Evolve's co-op vs. lone wolf formula has created some of the most intense multiplayer matches we've ever experienced."

"Evolve will be a generation-defining multiplayer experience," said Christoph Hartmann, president of 2K. "As our first new IP for next-gen systems, 2K is working with Turtle Rock Studios to deliver a game that's instantly entertaining."

WIZARDS OF THE COASTS PRESSES LEGAL TENDER, BECOMES OWN NATION

MAGIC THE GATHERING COLLECTOR COIN ANNOUNCED, PART OF A STRICTLY LIMITED AND HIGHLY NERDY RUN

In the pecking order of nerdy pastimes, I've long thought that Magic the Gathering and other collectible card games is right down there. After all, even snooty roleplayers may make fun of wargamers, but they both giggle at the mathematical obsessiveness of Magic players!

However, in some kind of event horizon of geekery, those existing within the Venn diagram crossover between Magic players and coin collectors are about to get really, REALLY excited. Wizards of the Coast and the New Zealand Mint have announced a partnership to create a limited run of Magic the Gathering Collector Coins.

The first coin - yes, there will be more - is an ounce of .999 pure silver, shaped like a Magic card, and limited to a run of 5000 coins. On one side is a piece of speccy Magic art, while the other boasts the head of our Queen and sovereign. And, yes, it is legal tender, worth a whopping \$2 on the tiny Pacific island of Niue, where its 1398 inhabitants are no doubt all avid Magic enthusiasts.

The coin will be available from March 1 this year, and you can register your interest here - http://www.nzmint.com/coins/Magic_Register



Designed for Enthusiasts. Engineered for Performance.

Corsair makes high-performance PC components and gaming peripherals with innovative designs that offer both leading edge performance and dependable operation. We build products that PC enthusiasts and experts will recommend to their friends...not just for their performance, but for their high value and reliability.



1 GAMING HEADSETS

Accurate audio reproduction for compelling gaming and the situational awareness you need for a competitive edge.

2 FLASH DRIVES

High-speed data storage in rugged designs lets you safely take your data with you.

3 MOBILE WIRELESS STORAGE

Voyager Air™ is the first all-in-one portable wireless drive, home network drive, USB drive, and wireless hub.

4 GAMING KEYBOARDS

Flexible and ergonomic designs, highly customizable and built with quality components for superior key feel.

5 POWER SUPPLIES

Stable, reliable power with a focus on high output, energy efficiency, and ease of installation.

6 FANS

Physics meets design in a line of case fans that work better, and look better, too.

7 CPU COOLING

Efficient, quiet cooling with zero maintenance and simple setup makes it easy to protect your CPU.

8 DRAM

Stability under pressure that's the result of superior engineering and fanatical screening for performance and reliability.

9 SOLID-STATE DRIVES

Amazing storage performance that will improve the speed of virtually everything you do with your PC.

10 CASES

Give your PC a new look for the new year. Corsair has the industry's widest selection of bulder-focused, builder-friendly cases.

11 GAMING MICE

Precision gaming tools that help you play your best...whether it's professionally, or you're just playing to win.

12 GAMING MOUSE MATS

Corsair gaming mouse mats are tuned to deliver outstanding glide characteristics without sacrificing control. And, they're available in multiple sizes to fit your playing style.

MOST WANTED

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



◀ LG HEART RATE EARPHONES

In keeping with the whole wearable tech thing, you might think mere headphones are nothing new - but LG's managed to fit more than good sound into these in-ear buds.

LG's Heart Rate Earphones - okay, the name might be giving it away - measure blood flow inside the ear to track heart rate, oxygen uptake, and other biometric data. A clip-on medallion connects with your mobile device via Bluetooth, or LG's new LifeBand Touch.

And with a flexible ear piece, they're comfy, too!

www.lg-one.com

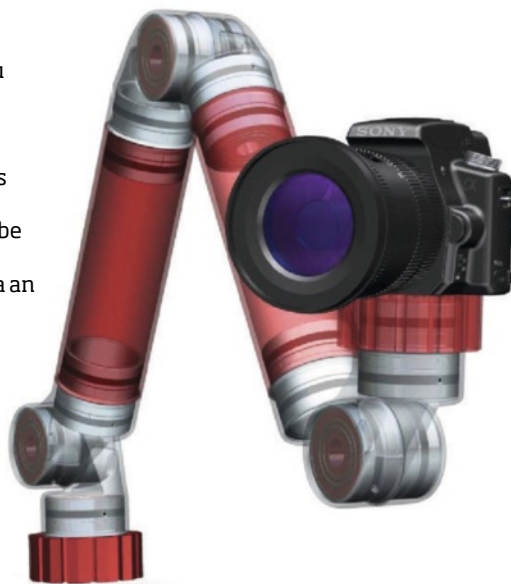
MODBOT ▶

We all love Lego, and we all love programmable Lego that lets you make Lego robots. But what if someone came at this from the opposite direction, making robotic parts that could be assembled with the ease of Lego...

Cue Modbot, one of the most interesting innovations out of this year's CES in Las Vegas.

Designed for inventors and enthusiasts, the Modbot parts can be put together in a variety of ways to create limbs, armatures, and even entire robotic creatures, which can then be programmed via an app or on your PC. It's the ultimate robotics kit.

www.modbot.com



▼ LOGITECH X100

Tech used to be kind of mono-colour, but these days everything from fitness bands *ahem* to headphones and more are coming out in a range of 'dynamic', 'rainbow', 'exciting' colours. Logitech's now gotten onto that bandwagon with its new X100 speaker, a tiny Bluetooth speaker that's available in "five eye-catching colours".

With five hours of battery life and a built-in mic for taking calls while listening to your tunes, it's a pretty handy accessory for any mobile device.

www.logitech.com.au





◀ MASS EFFECT: GALAXY AT WAR RISK

I love Mass Effect, I love board games, and I love grand military strategy. So the idea of an iteration of classic boardgame Risk, set during the Galaxy-spanning war in the background of Mass Effect 3...

Hhnh - I need a moment.

Galaxy at War boasts three different game modes, with over 250 pieces comprising two Alliance armies, two Reaper armies, one Cerberus army and 2 Harbinger pieces. There's a tonne of other cards and markers, and a gorgeous map board.

Sadly it doesn't use your old Mass Effect save games.

www.amazon.com

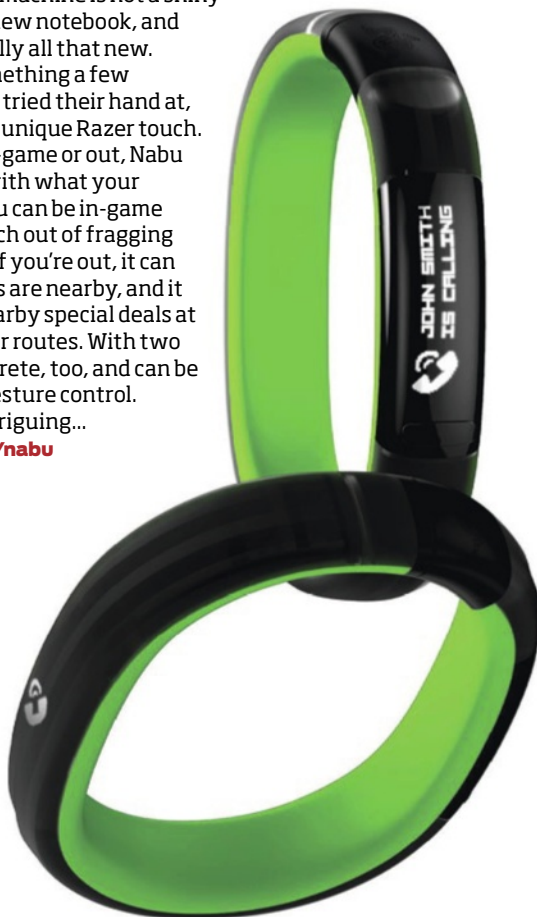
RAZER NABU ▼

Razer's latest dream machine is not a shiny mouse, nor a funky new notebook, and nor is it anything really all that new. It's a smartband, something a few manufacturers have tried their hand at, but this one has that unique Razer touch.

Whether you're in-game or out, Nabu keeps you in touch with what your friends are doing. You can be in-game and not have to switch out of fragging to get notifications; if you're out, it can tell you when friends are nearby, and it can also notify of nearby special deals at shops on your regular routes. With two screens it can be discrete, too, and can be programmed with gesture control.

It's annoyingly intriguing...

www.razerzone.com/nabu



▲ TP-LINK 300MBPS UNIVERSAL WI-FI RANGE EXTENDER TL-WA850RE

A lot of us aren't lucky enough to live in a large house, but for those who do have large, multi-level houses there is a disadvantage - wireless coverage.

There is a fix, however, in the shape of a Wi-Fi range extender, and we're a bit fond of TP-Link's latest effort, the TL-WA850RE.

It's a small, elegantly curved unit that just plugs straight into your wall, letting you boost the range of your network. With 300MBps wireless N speeds, it's great for dealing with deadspots in the house, or attached areas like garages and backyards.

www.tp-link.com.au

SAY GOODBYE TO BAD WI-FI EXPERIENCE

7 TIPS TO WI-FI PERFORMANCE OPTIMIZATION

Frustrated about poor reception and/or slow performance with your home wireless network? Record shows that such issues may often be the result of a less optimized default setting, or simple placement issues of wireless networking equipments. You can under most cases easily improve your wireless network without additional investment.

PLACEMENTS OF DEVICES:

Radio signal travels through air to its destination. The radio signal will be reflected, refracted, or absorbed if there is any other medium in its path. This leads to the first golden rule wireless networking, **“Keep the wireless station away from blockage, especially metal and bricks.”**

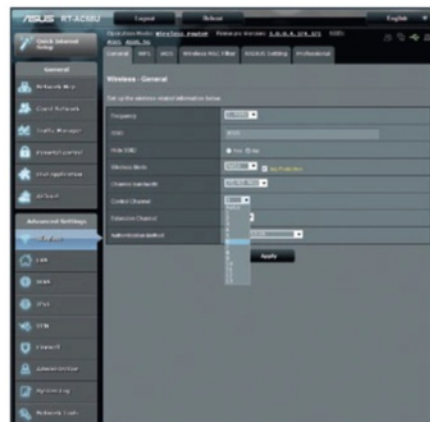
ANTENNAS POSITIONING:

The other thing that matters is what's so called the dead zone, which is the space right below the wireless router. The dead zone is there as most modern home routers come

with dipole antenna, while the radio signal only circulates around the antenna, the space outside the coverage of such antenna will be the dead zone. This leads to the second golden rule of wireless networking, **“Position your antenna in multiple directions to avoid the generation of dead zone”**. Some ASUS wireless routers feature Ai Radar, Explicit beamforming, and Implicit beamforming function that shapes wireless band omni-directional signal to a stronger unidirectional one to improve both the signal strength and throughput. You can consider to enable them to improve wireless reception if available.

HANDLING RADIO INTERFERENCE:

Your wireless signal may or may not be the only 2.4GHz or 5GHz signal in your environment, whereas radio signal interferes with each other if they appear in the same frequency band and channel, resulting in poor transmission quality. This leads us to

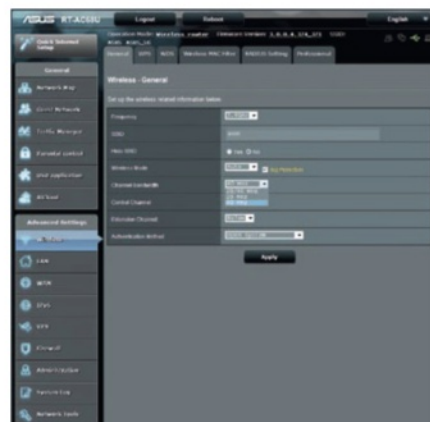


the third golden rule of wireless networking, **“Use the least used wireless channel when possible.”** Keep in mind that wireless station manufactures has no way to tell which channel are the least crowded in your environment, hence it is always ideal to manually configure the control channel to the least used channel for optimal reception and throughput.

MAXIMIZING CHANNEL BANDWIDTH:

Later generations of wireless protocol may utilize higher channel bandwidth to deliver the superior performance from the previous. However, considering the wireless station manufactures has no way to tell whether the

Advanced Settings	Date to Enable Radio (weekend)	<input checked="" type="checkbox"/> Sat <input checked="" type="checkbox"/> Sun
Wireless	Time of Day to Enable Radio	00 : 00 - 23 : 59
LAN	Set AP Isolated	<input type="radio"/> Yes <input checked="" type="radio"/> No
WAN	Roaming assistant	Disable
IPv6	Enable IGMP Snooping	Disable
VPN	Multicast Rate(Mbps)	Auto
Firewall	Preamble Type	Long
Administration	AMPDU RTS	Enable
System Log	RTS Threshold	2347
Network Tools	DTIM Interval	3
	Beacon Interval	100
	Enable TX Bursting	Enable
	Enable WMM APSD	Enable
	Optimize AMPDU aggregation	Enable



user needs to use older wireless equipments in the same environment, most wireless routers have defaulted the Wi-Fi channel bandwidth to a mixture of various values to ensure connectivity. It is therefore ideal to consider fixing the channel frequency to one highest channel bandwidth supported by all wireless devices that is going to be connected to this wireless router for optimal results, and avoid using a mixture of multiple

The classic example is the TKIP encryption method that can be adopted by WPA authentication. Experimental result shows that the network performance may be seriously impacted when attempting to utilize TKIP to encrypt data transmitted via WPA protection. It is highly recommended to avoid the use of TKIP encryption, and stick to AES in a WPA protected network to ensure the network performance is not to

“The stylish ASUS RP-N53 can easily extend your wireless network coverage whether you run a 2.4GHz or 5GHz band network”

channel bandwidth unless absolutely necessary. This then leads us to the fourth golden rule of wireless networking, **“Select the appropriate highest wireless channel bandwidth to maximize wireless throughput”**.

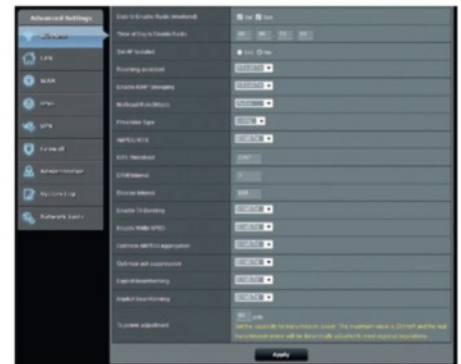
ENCRYPTION:

For security reasons, data encryption is always essential, as wireless data packets travels through air, and may be analyzed by undesirable parties if the floating data is captured. However, this also leads to the generation of undesired network overheads.

be impacted. Therefore the fifth golden rule of wireless networking is obviously, **“Select the appropriate latest encryption method to maximize wireless throughput”**.

OTHER UNIQUE OPTIONS:

Some more advanced routers may come with unique options to improve network transfer performance, such as TX Bursting, Optimize AMPDU aggregation, Optimize ack suppression, and of course, the Turbo QAM. Enable these options if both your router and wireless devices support such function to maximize network throughput. Therefore

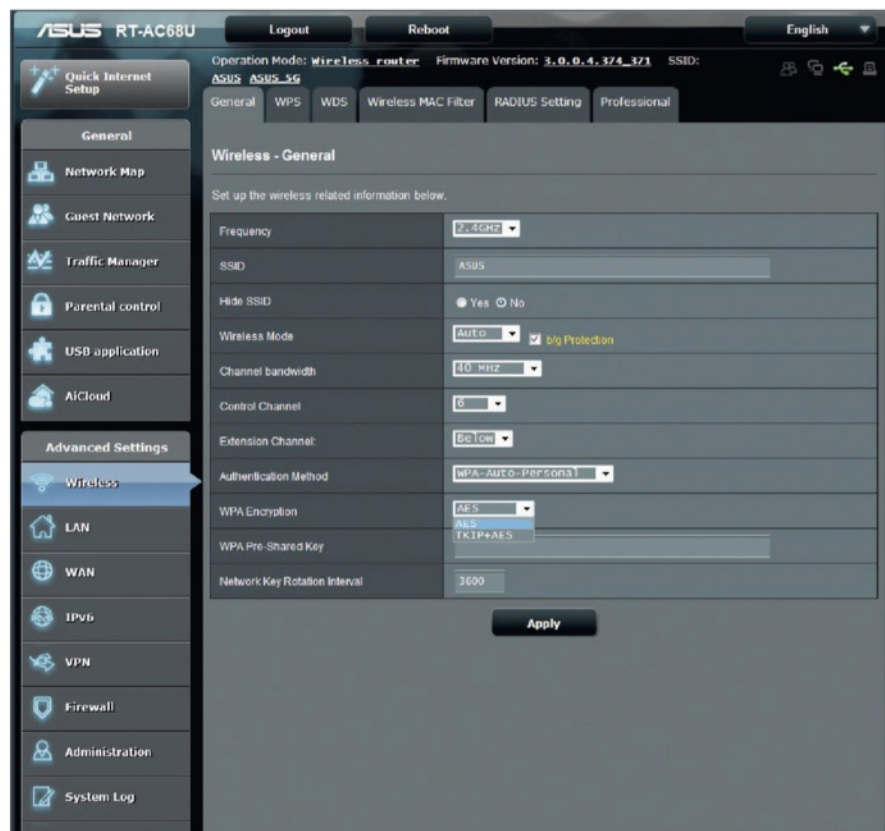


the sixth golden rule of wireless networking will be, **“Make good use of the advanced bandwidth boosting options whenever possible”**.

FURTHER EXTEND THE WIRELESS COVERAGE:

To further extend the network coverage, one can also consider invest in a Wi-Fi Repeater such as the ASUS RP-N53 or repeater function enabled router at locations that has good reception from the original source to rebroadcast the signal it receives. This is the final and the seventh golden rule of wireless networking, **“Utilize multiple wireless station to extend broadcasting range”**.

Though wireless networking brings convenience to the life of modern households, they may or may not be used to their full capability. Check your Wi-Fi settings, and optimize your network settings today, you will be surprised by how much more you can get out of these little buddies.



RP-N53 Dual-Band Wireless-N600 Range Extender

ONE-PRESS SETUP | CABLE FREE

AVAILABLE NOW
at major computer
stores near you!



Who's reviewing the online reviewers?

ROSALYN PAGE LOOKS INTO THE NEW GUIDELINES FOR CONSUMER REVIEW SITES, AND WHAT THEY MEAN FOR YOU – AND THE COMPANIES ABUSING THEM!

The social media weary might groan when a new app or website asks you to log in with a Facebook profile and start sharing updates with your social friends.

It's not just our whereabouts we're being encouraged to share. Our views on products and services are increasingly valuable to businesses that have to compete for credibility online.

One thing we've always done is tell a friend if we got a particularly good deal or a particularly raw deal on something. You tell two friends and they'll tell two friends and so on and it could make or break a business' reputation.

Today this need to share and rate your experiences can be satisfied, like everything else, on a website. This time so many more people can read about your experience – good, bad or indifferent.

Search giant Google understands the power of a positive review. Not so long ago it started including people's Google comments and recommendations in ads, so we could be sharing and comparing without realising it.

Google isn't the only one that wants us to turn to others through technology to share and compare. Reviews can be found on Facebook pages, shopping sites, business or product review sites, through Twitter posts and on forums and discussion threads.

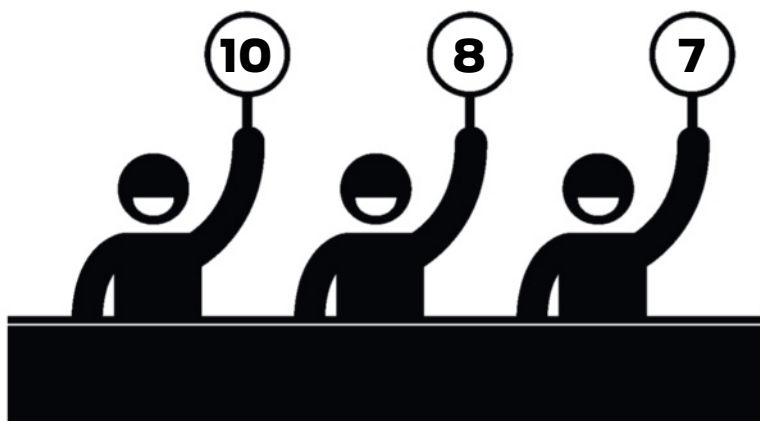
Online reviews are an easy way to crowdsource try-before-you-buy. But they're only as good as the honesty with which they're created. Who hasn't read a scathing restaurant review or a recount of a bad experience with a product and avoided it? On the other hand, who hasn't read a glowing review and been a little persuaded?

It has to be said that reviews need to be put through the review-filter. It's usually pretty easy to spot a particularly disgruntled customer who got the dud service or the 1 in a 1000 product that was DOA. You've got to gauge the mindset and possible vendetta of the reviewer and read



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



enough reviews to average out the results to remove the cranky outliers and positive spinners. It's necessary to review the reviewers and ask yourself some questions.

Is the reviewer a professional pedant who enjoys the takedown of a product in all its minutiae? Is the reviewer a hyperbolist who overstates the good and bad aspects of a product? What about if they're like the scales of justice and are too balanced and can't make a definitive judgement about something?

On the other hand, there are the overblowers who take a small quibble with something and make out it's a fatal flaw. There's the versioner who doesn't like the new version or upgrade of an app and posts scathing reviews. Where some see a new, improved or updated function, others see an absent older feature sorely missed.

The ACCC recently took issue with online reviews and reminded business that by not removing reviews that are known to be fake, they could be breaching consumer law by misleading consumers.

It also had some advice for consumers about using online reviews. It suggests that you:

- Seek information from multiple sources;
- Look at multiple reviews and comments about the same business and take note of any irregularities, such as a spike in positive reviews

over a short period of time or multiple reviews with a similar tone and vocabulary;

- Be wary of reviewers or online contributors whose profile indicates that they have only ever written one review. The profile may have been created to write a fake review.

If you spot reviews that you believe are fake, then report them to the business or review platform. You can also contact the ACCC and alert them to investigate. The ACCC's advice is to use sites that require proof of purchase before reviews can be submitted.

Online reviews serve a useful purpose, giving you the benefit of many trialists reporting on a product and how it works or doesn't work as the case may be. Sometimes there'll be so many reviews pointing out a dud feature or a problem with a product's functioning that it's easy to see it's a deal breaker.

But online it can be harder to judge the motivations and source of reviewers. A healthy dose of scepticism should help. Or you could just ask a friend.

**HAD AN ISSUE
AS A CONSUMER?
INVESTIGATOR
CAN HELP.**

Email: investigator@pcandtechauthority.com.au

I'm next generation



iX500

- Simple, speedy & compact – from paper to PDF in one-touch
- Windows / Mac OS cross-compatible
- 25 ppm (simplex) / 50 ipm (duplex)
- Equipped with Wi-Fi enabling direct link to Smart-phones and tablets
- Easy link to cloud services

Enables productivity beyond your imagination

All new iX500, a next-generation model from the best-selling line of personal document scanners, the ScanSnap series, which deliver simple and quick paper-to-PDF digitisation in a compact design.

If you would like more information, please contact Proscan 1300 132 001

au.fujitsu.com/scanners

shaping tomorrow with you

FUJITSU



THE ULTIMATE GUIDE TO HOME NETWORKING

CAMPBELL SIMPSON DELVES INTO THE INTRICACIES OF SETTING UP A NETWORK IN TODAY'S HYPER-CONNECTED, MODERN HOME. FROM THE BEST HARDWARE, TO SETTING UP AND GETTING IT WORKING, THIS IS THE ONLY GUIDE YOU NEED

Let's all agree on one thing: home networking is not especially cool or sexy. Unless you're of a particularly avid breed of PC enthusiast, networking is mostly a means to an end, and it works best when you don't notice it at all. That's why setting up a home network can seem like an arduous task, but with a little bit of effort and research, you'll have it sorted in no time.

We've focused on putting together a guide on how to set up your home network as simply as possible. This isn't so much about the physical process of connecting cable to router to PC - you've got instruction manuals for that - but instead, we want to guide you on how to figure out the best networking setup for your home, what gear to buy, and what pitfalls to avoid.

WHAT DOES A NETWORK DO?

Depending on your requirements, a network can do any one of a hundred different things. It can connect your home PC to the Internet, joining your computer to the much larger network of the World Wide Web. A network lets you transfer files from one computer to another, too - communicating



between multiple PCs within your household. An extension of this is enabling your PCs to share files and data with other networked devices, like printers or smartphones. If you have more than one computer, and you want to connect them to the Internet, a network is mandatory.

More complex uses of a home network can include streaming music, movies or photos from a PC or networked storage drive to a media player, like a Blu-ray player or media streamer, to watch remotely on your TV. This is very useful - a home network's high speed means you can watch any high-resolution media files without having to transfer them onto a flash drive or portable hard drive and plugging that into your TV.

If you have a PC with a large hard drive, or a network-attached storage device (or NAS), you can also use your network to back up files from your PCs, or to store data in one place for multiple devices to access it. Think of a NAS as an optional extra for your home network - you can use it like a filing cabinet for all your data, freeing up storage on PCs while consolidating files in one place for all your devices to easily access.

SO HOW DO I GET MYSELF A NETWORK?

If you don't have a home network already, you only need to buy a couple of components to make it all work. At a minimum, you'll need a router. If you have lots of devices, you may need more networking gear. The process is simple - work out what your requirements are, find a router (and any other equipment you need) that suits those requirements, and set it up.

At its most basic level, a home network only requires a PC and any other network-capable devices you already own, a wired/Wi-Fi router, and network cables if you're connecting directly to the router (instead of using Wi-Fi). If you want to access the Internet, you'll need a subscription to an Internet service provider. If you don't already have a router, the main step in setting up a home network is working out which router to buy. After that, all you need to do is set it up.

Of course, you can always hire a technician to come out and set your network up in person if you get stuck. You can even pay them to do the entire job of choosing and installing your networking gear, if it comes to that. If



Running two separate home networks

Writing about technology as a freelancer, I work out of a home office, in a house that I share with four other people. The house actually has two networks set up – one for me, and one for everyone else. It's a two-storey building, with four bedrooms and a garage out the back.

The house's main network is almost entirely wired, for speed and reliability reasons. It all runs off a Linksys X3000 wired/Wi-Fi ADSL2+ router in the office, as close as possible to the first telephone outlet on the house's circuit to maximise Internet speeds. There are two PCs in the office connected to the main network with Category 6 patch cables. In-wall Cat 6 network cabling runs from the office to half a dozen other rooms in the house, but only two rooms currently have computers that hook into the main network – four PCs in total, using all four of the router's LAN ports, all running at gigabit speeds. A few smartphones and a smart TV are connected over the Linksys router's 802.11n Wi-Fi, but the signal only barely reaches each corner of the house.

Similarly, my personal network is almost entirely wired – again, because it's faster and more reliable. I don't use the main network at all, which means I can't access the Internet over ADSL2+, but because I don't use much data, I get by on a Telstra 4G mobile broadband connection. Everything runs through a brilliant Dovado PRO router (perfect if you use mobile data) and a Netgear GS108P switch – I've got a Windows 8.1 PC, ioSafe N2 NAS, Xbox 360, Oppo Blu-ray player and Canon printer all hooked up over Ethernet. The Dovado PRO also does 802.11n Wi-Fi, which I have a couple of smartphones, a couple of Wi-Fi light bulbs, a Surface 2 and an Android tablet running on. The wired network setup means I can stream super-high bitrate video files from the NAS to the Blu-ray player to watch on my plasma, without any slow-down or buffering problems.

The two networks are entirely separate from each other, and apart from seeing both Wi-Fi signals whenever I connect a new device, there's no interaction between them at all. The obvious black-spot in my network design is the garage. My personal network actually has better range than the main network, since the Dovado router uses external antennas and it's placed up on the second storey, but it's still sketchy outside the house. If I desperately wanted network coverage in the garage, I could install a wireless repeater and connect it to either of the networks, or go through the headache of running an Ethernet cable from the home network to the garage, but it's not necessary. Maybe if I owned a Wi-Fi-enabled electric car...

you do that, make sure that you ask them to give you a run-through on the important details of your network, like your Wi-Fi network name and password, the Web address of your router, and the answers to any other questions you can think of.

WHAT NETWORKING GEAR DO I NEED?

The most important stage of setting up your home network is not actually the setup process, but the planning. You've got to take stock of all the devices you own that will need to be connected to the network, any future devices you plan to buy, and then add a little headroom for safety's sake.

Home networks can range from comparatively simple setups to complex, multi-layered constructions. It all depends on the number and variety of devices that you want to connect

to each other and to the Internet. If you just have one or two computers, all you need is a simple wired or Wi-Fi router, and some network cables, and you're on your way. If you want to add more computers, or introduce extra wireless devices like smartphones, laptops or printers, you'll need to do a little more research. Remember that there are a huge range of devices that can connect to a network, and connecting to a network is necessary if you want to easily share them or access the Internet.

If you're starting with a blank canvas, you need to know what kind of Internet connection you have or can get; this determines the design of



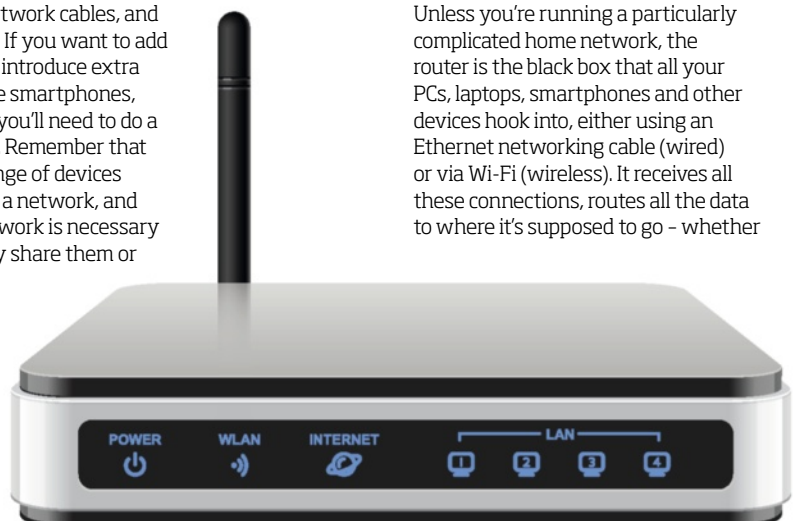
your home network. If you have ADSL2+, accessed through your house's telephone lines, you can buy an all-in-one wired or wireless ADSL2+ modem/router. If you have cable internet, if you're still on dial-up or if you have a niche connection like 4G mobile broadband, satellite internet or the NBN, you can just buy a router that connects to the existing modem you already

“The most important stage is not the setting up of a home network, it is the planning phase”

have. If you don't have a modem either on one of these connections, you'll have to buy a combined modem/router for your connection type (ask your Internet service provider), or pick up a modem plus a router and connect the two.

WHAT EXACTLY IS A ROUTER, ANYWAY?

Unless you're running a particularly complicated home network, the router is the black box that all your PCs, laptops, smartphones and other devices hook into, either using an Ethernet networking cable (wired) or via Wi-Fi (wireless). It receives all these connections, routes all the data to where it's supposed to go – whether



Dovado PRO router

I use this router because I connect my personal network to the Internet using a 4G mobile broadband connection, using a Telstra USB 4G dongle. There aren't many routers on the market that can control a 4G stick at full speed, but the Dovado PRO does it perfectly – almost all of Australia's 4G devices are supported, too, and work without any fiddly setup needed.

It's simple to configure, supports gigabit Ethernet and 300Mbps Wi-Fi, and is surprisingly affordable. I hook the PRO up to a Netgear switch for all my network's wired connections – since I use more than the four ports available on the back of the Dovado router – but the integrated Wi-Fi is both fast and long-range and handles half a dozen wireless devices with ease. The guys at Dovado are also incredibly helpful and quick to respond with tech support.



that's to the Internet, or to another device on your network – and ensures that all your devices are correctly communicating with each other.

If you have an ADSL2+ broadband connection, you can buy a router with an integrated modem. With a modem/router, you're able to enter the username and password from your Internet service provider (or ISP), and the router will connect to the Internet after it's plugged into your home phone line.

Choosing a router is the most important part of planning and setting up your home network. You need a router that suits your purpose – there's no point buying an ADSL2+ router if you have cable internet – and one that has the right feature-set for your current and future needs. If you want Wi-Fi, only look at routers with integrated wireless. If you want less common features like automatic Internet access scheduling – to restrict access during homework hours, and so on – that will further narrow your search. Do your research on a variety of routers from a few brands like Cisco, Belkin, D-Link and Netgear, pick your favourites, and work from there. Once you've found one or two models that look just right for what you want, look around online for the best prices.

WHAT OTHER GEAR DO I NEED?

At a very basic level, all you need to build a network is a router. Turn

it on, set it up, and you'll be able to connect PCs and other devices to it with Ethernet cables and Wi-Fi (if you bought a wireless model). If you have more complicated requirements, though – maybe you want to back up data, or stream videos wirelessly to your Smart TV – there are other components that you can buy to make the process easier.

A NAS is the best choice to make if you want a reliable, always-on storage device for backing up your PCs and other important data. NAS boxes are designed with reliability in mind, using multiple hard drives to store extra copies of your data in case one fails. They can

also share your media files using DLNA, a protocol for streaming video and other media files around your house. A NAS is comparatively expensive, but there's no ongoing expense other than the cost of electricity, since most come with free backup and media server software.

If you have more PCs, printers or other wired network devices than your modem/router can handle, you'll need a dedicated network switch. Most routers can only handle four wired connections simultaneously, but even a small network switch will have twice as many wired network ports. If you do use a network switch, connect all your wired devices to it, and use a single connection between the switch and your router.

If you want to connect your PC using Wi-Fi, but don't already have wireless inside your computer, you'll need to buy a Wi-Fi card or USB dongle. These are reasonably cheap and simple to install – especially USB devices, which work automatically with Windows 7 onwards. Whenever you're picking out a new Wi-Fi device, make sure it uses the same

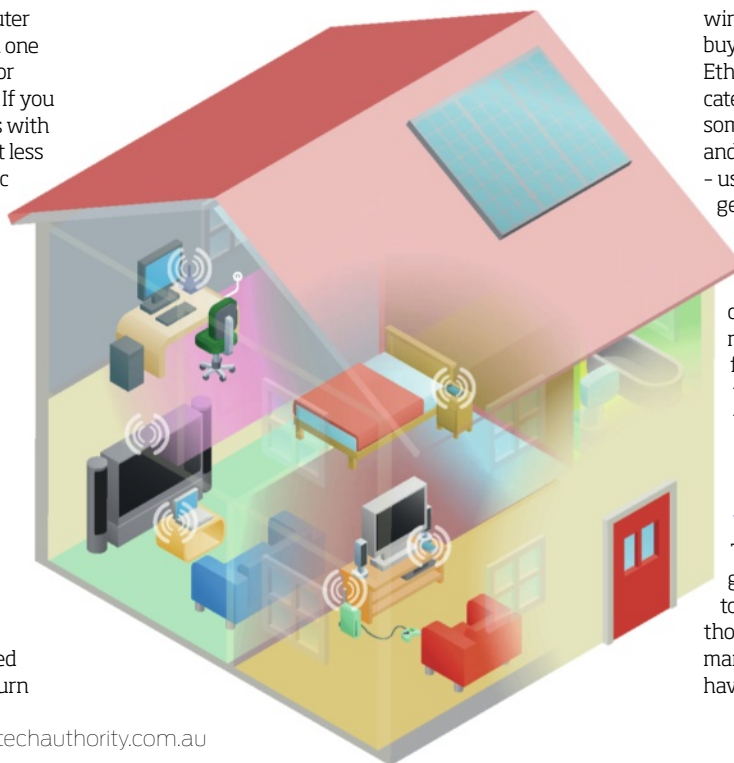
"If you have more PCs, printers or other devices than your router can handle you will also need a switch"

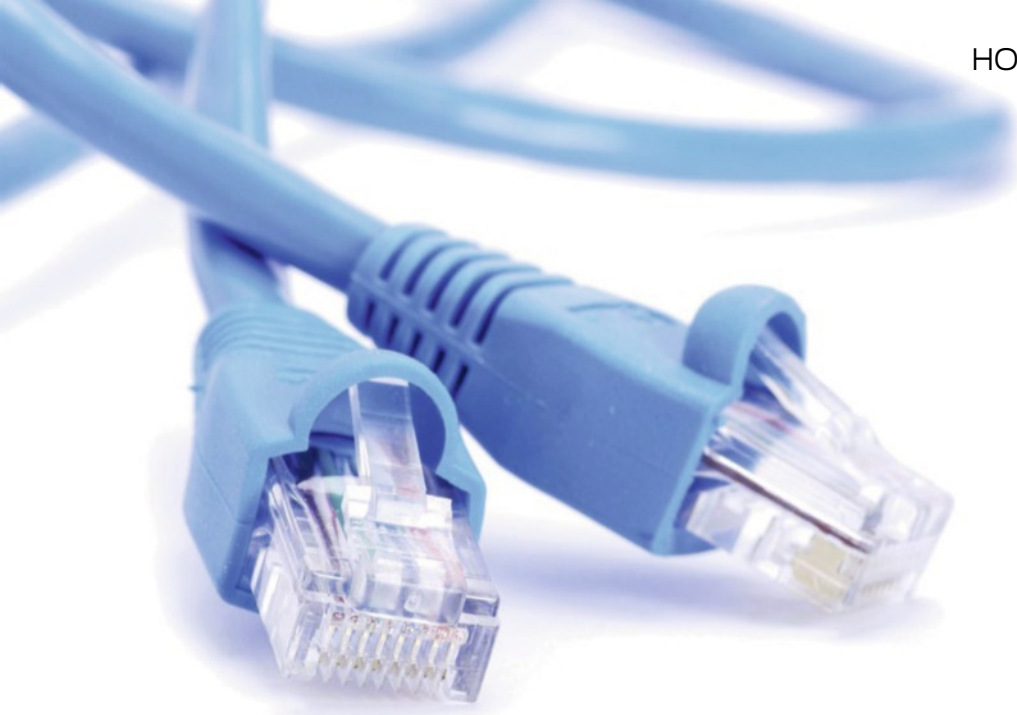
Wi-Fi standard as your router, or faster – you don't want to be stuck with a slow Wi-Fi connection.

When you're buying Ethernet network cables to connect all of your wired devices, make sure you're buying the best quality cables possible. Ethernet cable comes in different categories, and cheaper cables are sometimes downgraded. The newest and fastest standard is Category 6A – use it wherever possible. If you're getting your entire house wired with network cable, Category 6 cable is cheaper, but the difference in price is small. Avoid Category 5E or Category 5 cables if you can; the newer Cat 6 cables may be overkill for home use, but you never know what the future holds, and having to pull new cables through walls is a frustrating task.

THE BIGGEST QUESTION: WIRED OR WIRELESS?

There are a dozen different ways to get one device in your house talking to another. One thing is indisputable, though: these days, it's almost mandatory for your home network to have at least some wireless capability.





faster option, though – your wireless speeds are limited by the devices you want to connect, as well as the wireless router itself.

Buying an 802.11ac router isn't necessary if you don't have any wireless devices that support the 802.11ac standard, since Wi-Fi requires both devices to support a standard for it to be used (if it's not, the router will switch to a slower mode for that connection). If you want to future-proof your network, it's worth considering the high-speed 802.11ac option, but remember that you'll pay more initially and in ongoing power costs for the privilege. If we were buying a new router today, we'd be hard pressed to choose anything other than a high-end 802.11n unit, with external antennas for maximum range.

Wi-Fi routers have a huge range of features, and those features have different names depending on the

Laptops, tablets, smartphones and smart appliances all rely on Wi-Fi, and built-in wired networking is becoming more difficult to find on even high-performance laptops. When guests stay over, they'll bring their own devices, and you should be a gracious host and share your network.

If it was down to us, we'd always opt for a wired network wherever possible. Hooking up your permanent devices to a wired network gives you the peace of mind that they're always there, with the ability to access files or transfer data at high speeds. Wireless is making huge strides in speed and reliability with the 802.11ac standard – it claims to offer faster speeds than gigabit Ethernet (with a few large caveats) – but unless you have a pressing, overriding need to choose Wi-Fi, we'd stick with good old-fashioned copper wiring.

There are some situations where using a wired network is impossible or impractical, though. If you don't own your house or apartment, you can't run network cables through the walls without permission, effort and expense. If you live in a large house, the cost of professionally running a cable from one side of the house to the other can be as high as the cost of the rest of your network. If one or more of your devices just doesn't have an Ethernet networking port, you're out of luck too. In all these circumstances, having Wi-Fi becomes a necessity.

So it's not a question of purely wired or purely wireless, but how much of a wired network you can handle installing, and how much will have to run on wireless through necessity.

An alternative to using Wi-Fi is using 'powerline' network adapters from companies like Netgear and Belkin,

which plug into your house's electrical outlets and transmit network data over the power cabling inside your walls. They're useful in a pinch, but they're slower than a proper data cable and can sometimes suffer from interference from surge protectors.

WHAT WI-FI ROUTER DO I WANT?

There are a few different Wi-Fi standards on the market. You'll have to make a choice between 802.11n, with a maximum transmission speed of 300Mbps, and 802.11ac, with maximum transmission speeds of 600Mbps or higher. It's not as simple as choosing the



ioSafe N2 NAS

Since I like my PC running smooth and fast, I only have a solid-state drive in it. This is great for fast boot times, speedy gaming and low power consumption, but it's not so good when it comes to massive amounts of storage – my PC's SSD only holds 256GB of data. Since I have a few dozen Blu-rays saved as media files, I need hard drive space – and this is where the NAS comes in.

With two 2TB drives inside, running in RAID 0 for around 4TB of overall storage, the ioSafe N2 connects directly to my network, letting me watch saved movies and shows on my TV via my Blu-ray player, and serving as mass storage for my PC. It's based on one of Synology's excellent DiskStation NAS devices. I store my important documents, photos, data backups and media files on the NAS, and it powers down whenever it's not actively in use, saving electricity and prolonging the life of the hard drives inside. ioSafe specialises in disaster-proof storage, too, so the N2 will survive a fire or flood.



brand you choose. Some of the most common features include a separate 'guest' network (restricting access to other computers or to the Internet), and apps that let you monitor and adjust your router's settings from a mobile device. Have a good think about your needs, and decide whether you want these features, and whether it's worthwhile paying for a more expensive router, with any other advantages it brings.

CAN I RUN NETWORK CABLING THROUGHOUT MY HOUSE MYSELF?

Well, sure, you can, but it's not legal. There are all kinds of regulations that need to be followed when wiring a house or apartment up with network cable, and only a certified electrician or cabling installer can sign off on them. There are fines for knowingly hooking a dodgy or uncertified network up to Australia's telephone network (through

the ADSL2+ Internet connection in your modem/router), and you don't want to be sluggish with a \$20,000 fine from the government just because you crimped a cable incorrectly – it's easier to just pay someone else who does this for a living. Plus, if something then goes wrong, it's not your fault, and can be fixed with a phone call.

Here's another suggestion: as well as getting a registered cabler to do the work for you, open your wallet and commit to getting the job done right the first time. Even if you're in a relatively large house, or even if you don't foresee needing network or Internet access in that room straight away, it's a lot easier to run a network cable inside the appropriate wall for later use. Avoiding obvious black spots (who needs gigabit Ethernet in the laundry?), it makes sense to wire up most of the commonly-used rooms in your house. Bedrooms, office or study areas, your living room, a guest room – anywhere you might conceivably want a network connection in the future. It adds value to your house, and even if you never use it, someone else might be able to in the future.

SETTING UP YOUR HOME NETWORK

Twenty years ago, home networking setup was the mother of all headaches. As well as running cables (what's 'Wi-Fi?'), you'd have to deal with assigning static IP addresses, setting gateways, and all that terrible stuff. Thankfully, networks are now a lot simpler to set up, a lot more resilient, and a lot more adaptable to new devices.





overview. Your router will have its own Web page that you'll be able to access from any PC hooked up to it – look in the manual for info. That Web page will have a section dedicated to Internet access, and your ISP will have given you a username and password to enter in there. With the router hooked up to the phone line, that username and password will let the router dial in to your ISP, authenticate your connection, and then you'll be able to access the Web on any device connected to the router.

Beyond that, using your network should be fairly transparent. Any relatively recent Mac OS X, Windows 7 or 8 PC will be able to see all other computers on the network, and it's almost a certainty that your other devices will be visible as well. You should be able to view any of your computers' shared files on a media streamer or Blu-ray player that is connected via Wi-Fi or Ethernet, and depending on your smartphone you might be able to see them there as well.

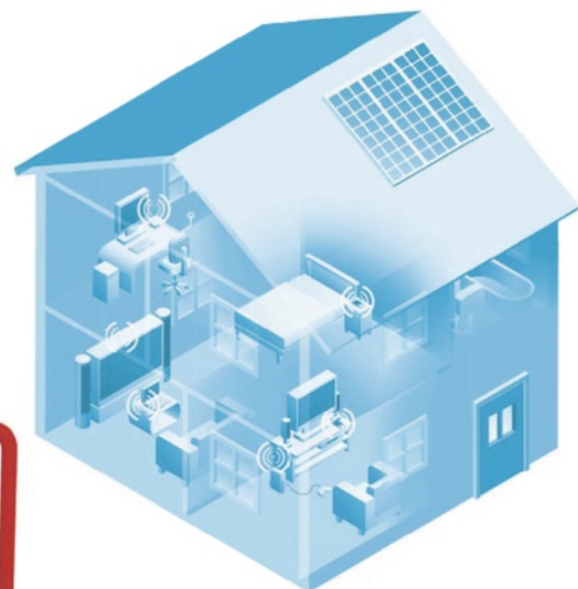
There are plenty of tweaks to improve your network, boost speeds and increase its reliability, but they're generally tailored to each specific network setup. If your router is modern, it should have some monitoring features that will let you track your data usage and network performance with a PC or smartphone app. That's always a good place to start, and from there, you can overcome any problems when you encounter them. ■

Here is where the instruction manual of your router (and other devices) comes in handy. It will give you all the information you need to know about setting up your network, and give you a hands-on, step-by-step guide on what to do for your initial setup. To run through the process, you'll need to have the router unpacked, plugged into power, and you'll have to use a PC, or Wi-Fi device with a wireless router, to access a Web page and change settings.

At the centre of your network, in almost all cases, will be your router. This is the router that connects to your ADSL2+ connection, to your cable modem, or to the NBN (if you're lucky enough to be living in the future). With

all your PCs, laptops, mobile devices and smart appliances hooked up, your router will begin assigning IP addresses through a hands-free process called DHCP – giving every network device a unique identifier, updating these identifiers when circumstances change, and acting as the switchboard for any data travelling between devices. This is the heavy lifting in networking, and it's all handled for you automatically, straight out of the box.

Other than that, the main hassle with your home network is getting it hooked up to the Internet. We can't give you a catch-all solution for that, but if you're using ADSL2+ (and chances are that you are), here's an extremely basic







OFFICE

RENT? BUY? DUMP?

MICROSOFT IS PUSHING USERS TOWARDS OFFICE 365, THE SUBSCRIPTION VERSION OF ITS PRODUCTIVITY SUITE. SHOULD YOU MAKE THE SWITCH, OR CAN LOW-COST AND FREE ALTERNATIVES DO THE JOB JUST AS WELL?

CONTRIBUTORS: TIM DANTON, SIMON JONES AND NIK RAWLINSON

For the past 30 years, there have been three certainties in life: you'll pay taxes, you'll die and you'll use Microsoft Office. This time has passed, however, and those of us who have been wedded to the world's dominant productivity suite need to ask: is it time to file for divorce?

Even Microsoft doesn't want things to carry on as before. It's pushing the rental model of Office 365, which involves paying a set fee per month or year for the privilege of using the latest version of its desktop suite. It throws

in a number of sweeteners, too: free Skype calls, the ability to use the software on up to five devices, plus heaps of free online storage.

But is that enough? Here, we take a look at the alternatives. There's the king of online collaboration, Google Drive; there's Apple's beautiful iWork suite, for both iOS and Mac; and there are open-source freeware packages such as LibreOffice. Of course, if you have an older version of Office, why not stick with that?

To find out what's best for you – and for your business – read on.

What is Office 365?

WE REVEAL THE STRENGTHS AND WEAKNESSES OF OFFICE 365, POSSIBLY THE MOST MISUNDERSTOOD PIECE OF SOFTWARE ON THE PLANET

Two years after its launch, there's still a surprising amount of confusion surrounding Office 365. Many people equate it with Office 2013, assuming it's simply the latest version of the desktop productivity suite. Others think it's a straight rival to Google Drive. However, as regular *PC&TA* readers will know, it's far more than either of those definitions.

It doesn't help that there are so many incarnations of Office 365 available. For home use, however, it's relatively simple: \$12 per month (or \$119 per year) buys you the latest version of the desktop Office suite, 20GB of online storage via Microsoft SkyDrive and an hour's worth of free Skype calls.

When it comes to businesses, Office 365 is as much about offering a service as it is about productivity software. Its first ace card is hosted email, with small businesses – up to 25 users –

small business owners at times. Larger businesses have a similar set of options, varying from a straight hosted email plan for \$7 per month to the full-fat Enterprise E3 option for \$33.30 (see the table opposite). But do the features merit the monthly payment?

DOCUMENT CREATION

In Excel and Word, Microsoft has the two undisputed heavyweights of the productivity division. Word lets anyone create professional-looking documents and, despite its detractors, the ribbon interface is key to this: all the most popular commands sit on the Home ribbon, meaning a few clicks can turn a dull page of text into something you'd be happy to hand out at a board meeting.

Excel is another brilliantly polished tool, with lots of built-in intelligence to speed up work. For example, if you

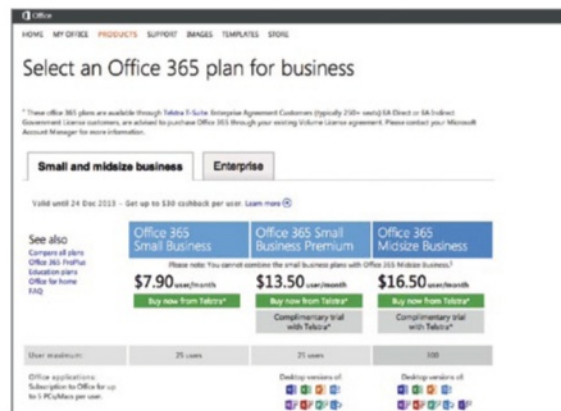
“Microsoft has the two undisputed heavyweights of the productivity division”

able to buy email, shared calendars and 50GB of email storage per user from \$7.90 per month. Also, employees can share “presence” information – for example, the fact they're in a meeting – send instant messages and conduct web conferences. Every user is allocated 25GB of storage on SkyDrive Pro, too.

If you shell out \$13.50 per user per month, employees also gain access to the main Office 2013 apps – including Access and Outlook – and a licence to use them on up to five PCs or Macs. At the moment this is only available from Telstra, but Microsoft announced last year that it would end that exclusivity (the only such deal in the world) and allow other providers to sell the subscriptions as well – the reliance on Telstra for Office 365 has been a major bugbear for IT support companies and

import a load of data and need to tidy it up, Excel will examine your columns and rows for patterns, so that when you start typing into an adjacent empty cell, the rest of the column will auto-fill. Let's say you have a column containing the full names of your employees; if you start typing someone's surname in an adjacent column, Excel will “Flash Fill” it with the surnames of all the employees. Its charts are also in a different league to those of most of its rivals – they look more professional, and Excel is better at recommending the right chart for your data.

PowerPoint is constantly improving, too. Again, Microsoft has made it easy to quickly achieve professional-looking results. That said, it lacks the glitz and slick inter-slide animations of Apple's Keynote. Also, while fewer people will



▲ There are three versions of Office 365 for small businesses, plus three for larger companies – no wonder confusion abounds

use Access (or Publisher, the desktop publishing software that's part of Office 365 Home Premium), it's capable in the right hands of producing complex databases.

Subscribing to Office 365 ensures you'll always have the most up-to-date version of the desktop suite. Home Premium buyers receive five desktop licences, which will work across Windows and Macs. What's more, if you need to do some work on someone else's PC, you can stream Office to that machine. Thanks to incredibly clever technology, you can be working in your customised version of PowerPoint in a matter of minutes.

ON THE MOVE

It wasn't long ago that Office's mobility features were limited to installing it on a laptop, but Office 365 turned this on its head. The central tenet is that documents are stored locally, then mirrored in the cloud via SkyDrive. This means you can access them wherever you are – and on whichever device you choose.

This vision isn't yet perfect, but it's improving. We used to criticise SkyDrive for ponderous synchronisation, but this problem seems to have been fixed. That said, Microsoft is still dragging its heels as far as creating a tablet version

OFFICE 365: SIX OF THE AVAILABLE LICENCES HEAD TO HEAD

	Consumer			Business		
	University	Home Premium	ProPlus	Small Business Premium	Midsize Business	Enterprise E3
Word	✓	✓	✓	✓	✓	✓
Excel	✓	✓	✓	✓	✓	✓
PowerPoint	✓	✓	✓	✓	✓	✓
OneNote	✓	✓	✓	✓	✓	✓
Outlook	✓	✓	✓	✓	✓	✓
Publisher	✓	✓	✓	✓	✓	✓
Access	✓	✓	✓	✓	✓	✓
InfoPath	✗	✗	✓	✓	✓	✓
Lync	✗	✗	✓	✓	✓	✓
Skype	1 hr/month	1 hr/month	✗	✗	✗	✗
SkyDrive	20GB	20GB	✗	✗	✗	✗
SharePoint	✗	✗	✗	✓	✓	✓
Exchange	✗	✗	✗	✓	✓	✓
Yammer	✗	✗	✗	✗	✗	✓
Users, devices	1, 2	5, 5	1, 5	1, 5	1, 5	1, 5
Licence term	4 years	1 year	1 year	1 year	1 year	1 year
Price	\$99	\$12/month	\$26.90/month	\$13.50/month	\$16.50/month	\$33.30/month

of Office is concerned. The likes of Documents To Go and QuickOffice show that it's possible to create a powerful office suite for iOS and Android tablets, and it's rather dispiriting every time Microsoft repeats its mantra that "we recommend using Office Web Apps when on a tablet" – especially since Android tablets can only view documents in Chrome, not edit them.

This is all the more odd when you consider that Microsoft has had phone-optimised versions of Word and Excel since the time of Windows CE, back in the early 2000s. These are still present on Windows Phone, and while there's no doubt they're more suited to viewing and making minor edits than true document creation, the fact that an executive can read a report, change text and make a comment while standing in line for a cappuccino makes them respectable tools.

Microsoft has recently added Android and iPhone versions of Office as well. Again, these are optimised for viewing documents rather than creating them, but it means you can make changes to your Office documents from most phones on the market. They all tie in to your Office 365 account, and you can be sure any changes you make won't spoil your formatting.

BUSINESS ADVANTAGE

We've already touched upon the hosted email benefits of Office 365, but its power for businesses – particularly for small businesses – comes when you consider the enterprise-level services it offers. Enterprises have long benefited from SharePoint and Lync, but Office 365 brings them in reach of the smallest company, and with minimal hassle.

Most business subscriptions come with SharePoint Online, providing individual and company-wide storage for common data, files and documents.

Lync Online, which comes with the business and enterprise subscriptions, gives you presence, instant messaging, application and desktop sharing, plus video- and audio-conferencing. You can even link it to your phone system or a VoIP provider to provide click-to-dial wherever you see a name in any Office application. In addition, Office 365 Enterprise subscriptions now include the social web features of Yammer Enterprise Network at no extra cost.

COLLABORATION

When it comes to collaboration, Microsoft is rapidly catching up with Google Drive. It's now easy to create a document, spreadsheet or presentation using a desktop version of Office and then open it up to everyone else – employees, other companies, friends, family – for editing and comments.

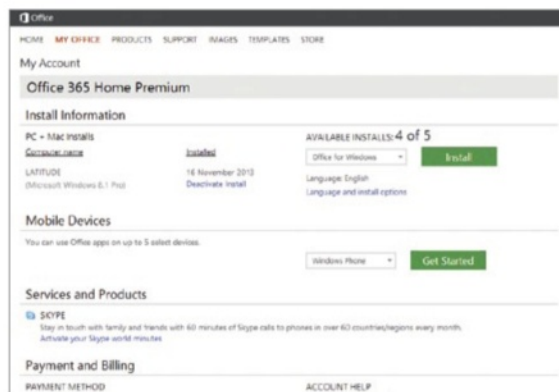
At long last, it's now possible for several people to make real-time edits using Office Web Apps (see p36) and see others' changes as they're made. You can keep the document open in your desktop app and refresh it to see changes, but we recommend switching to the Web Apps, since you'll see these changes as they happen. Of course, it's possible to share and collaborate using any of the online services; the advantage of Office 365 is that it gives you the power of the desktop apps when you're creating or making heavy edits to a document.

VALUE FOR MONEY

Although we balk at the thought of spending \$12 per month on Office 365 Home Premium, it offers decent value – if you use all the features. This is especially true if you want to use Office on multiple machines. For a serious backup regime, 20GB of online storage is enough, an hour's worth of Skype calls have a rough value of \$2, and you're buying five licences – enough for most families' needs.

For businesses, the variety of packages on offer, and need to be tied into Telstra, makes it difficult to pass a general judgement on Office 365's value for money. What we can say, however, is that you'll almost certainly be able to find a plan to suit your budget. The flexibility it offers means you can provide deluxe packages, with all the powerful tools, for those who need them, as well as basic email and intranet access for those who don't.

Whatever your needs, the argument isn't as simple as it once was. Take a look at the alternatives on the next few pages to work out what's best for you.



▲ Office 365 Home Premium allows you to install the latest version of Office on up to five PCs, including Macs, via the control panel



◀ The formatting sidebar tailors itself to show only options that are relevant to the object selected

VS Apple iWork

THERE'S A HUGE AMOUNT TO LIKE ABOUT APPLE'S SLICK COLLECTION OF PRODUCTIVITY APPS, WHETHER ON IOS OR MAC

iWork was once a Mac-only suite, and not a great one at that. With too much of a focus on making documents pretty, and too little on slipping into the background so users could get on with their work, it was a textbook case of Apple preferring style over substance.

Not any more. Pages, Keynote and Numbers are now the best productivity tools on the iPad, and although they barely changed between 2009 and 2013, the latest revisions show that Apple is serious about taking on its office rivals on the Mac, tablet and web.

MEET THE APPS

The iWork apps were released one by one, with Keynote appearing first, in 2003. Initially developed as an in-house application for building Steve Jobs' annual product presentations, the first release trounced PowerPoint, with better typography, more flexible layouts and more engaging transitions. PowerPoint has since caught up, but Keynote remains an extremely flexible and easy-to-use application, with great features such as Instant Alpha - which

lets you mask out image backgrounds without using third-party tools - and Magic Move, which animates object movements, Flash-style, as you flip from slide to slide.

Pages is a cross between Microsoft Publisher and Word, with the top-down writing environment encompassing a series of flexible object-based layout tools such as shapes, lines and textboxes. If you're used to working with nothing more complex than a blank page and a cursor, this may sound daunting, but - as with other iWork apps - it's easy to get to grips with, since all the formatting options are corralled in a context-sensitive sidebar that shows only the options relevant to the object selected on the page. It's a neater solution than the ribbon - newcomers should find it easier to identify the settings they need to tweak, since they won't have to click between tabs.

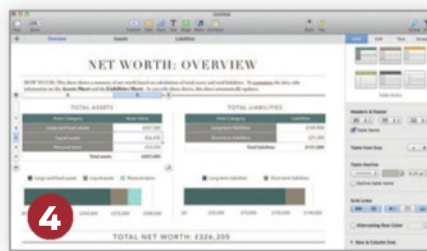
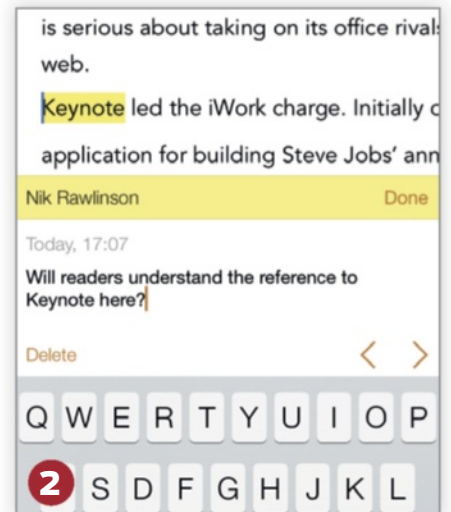
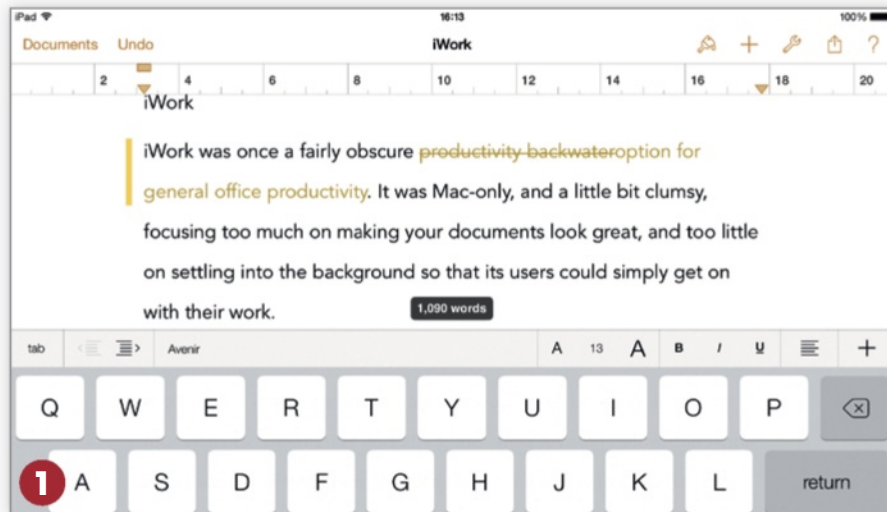
Numbers, the most recent addition to the suite, is a novel and effective reimagining of how a spreadsheet should work. It uses regular Microsoft Office formulae, but it doesn't confine

you to a single table on each tab. Instead, you can position multiple discrete tables wherever you choose, drag them around for optimal layout, and reference between them when constructing formulae.

With your data on view the whole time, this is far easier to get to grips with than when it's split across - and thus selectively hidden behind - separate tabs, as in Excel. Furthermore, since you can mix in floating textboxes and charts, you can quickly knock together attractive and meaningful financial presentations. These are often more attractive and meaningful than those created using Excel.

Apple's products are rightly lauded for their design credentials. As such, it's no surprise that each of the iWork apps ships with a range of templates you'll actually want to use.

As well as looking great, these are genuinely useful: Pages is bundled with layouts for posters, menus and newsletters; Numbers features sample spreadsheets for working out mortgages and savings; and Keynote



- 1 Even the iOS versions of the iWork apps allow you to track your changes
- 2 It's just as easy to comment on a file using the iPhone editions as it is using the full-blown Mac applications
- 3 There's no native iWork suite for Windows – if you don't have a Mac, iPad or iPhone, you have to work through the browser
- 4 Numbers lets you position several discrete tables side by side

allows you to build on less familiar sample slides that make a refreshing change from the PowerPoint defaults your audience may know all too well.

CROSS-PLATFORM

Apple made much of the fact that it rewrote the latest updates from the ground up to be 64-bit applications that exhibit flawless cross-platform compatibility, and true enough, you can open any Keynote, Pages or Numbers file on OS X, iOS or iCloud. That said, you can't always edit the results, and fonts aren't embedded within the documents, so obscure faces selected on the Mac may be swapped out temporarily when the document is opened on iOS or online. They'll reappear when you return the file to the Mac for further editing, however.

Each application uses its own file format, but you can import and export common Microsoft Office documents. You can also export to PDF and – in the case of Pages – RTF. The actual text of embedded WordArt is retained in Word documents, but the formatting is removed, and some of the more esoteric options in both Excel and PowerPoint don't transfer entirely smoothly. Apple is upfront about this, though, and maintains a complete list of compatible (and incompatible) document elements at <http://tinyurl.com/lw2sqdq>.

The latest upgrades aren't backwards-compatible, which is why

installing them on a Mac doesn't simultaneously wipe the 2009 versions of iWork from your drive. Also, there are no native tools for Windows, so PC users are able to use the web versions at www.icloud.com. Android users are locked out altogether, as the Android Chrome, Opera and Firefox browsers aren't supported.

You can store documents wherever you want if you're using a Mac – including Box and Dropbox – but if you're working through the browser, it's iCloud all the way. This is also the only online storage option for iOS users, although if you prefer, you can at least opt out of it altogether and work locally on the iPad or iPhone and never sync through a server at all.

Imported Microsoft files arrive with existing comments (although not Ink annotations) intact on OS X, but not on iOS or the web. Also, while you can track changes on both the Mac and iPad/iPhone, this feature is missing from the web app. However, you are able to collaborate with colleagues via all three platforms, and changes made remotely using the iCloud and iOS editions spawn a new revision of the document in OS X's core versions system. This gives Mac users the ability to roll back a document, spreadsheet or presentation to its previous state just in case something goes awry in the editing process on an iPad, iPhone or browser.

TO BUY OR NOT TO BUY

Unlike Office, iWork is a virtual suite – in other words, you buy the individual products. Numbers, Keynote and Pages are purchaseable from the Mac App Store and the iPad App Store for older devices – so buying each one on each platform adds up quickly, thanks to a per-user cost: with Office 365 Home Premium, you can install the latest version of the desktop version of Office (including the Mac version) on up to five PCs and laptops in your household.

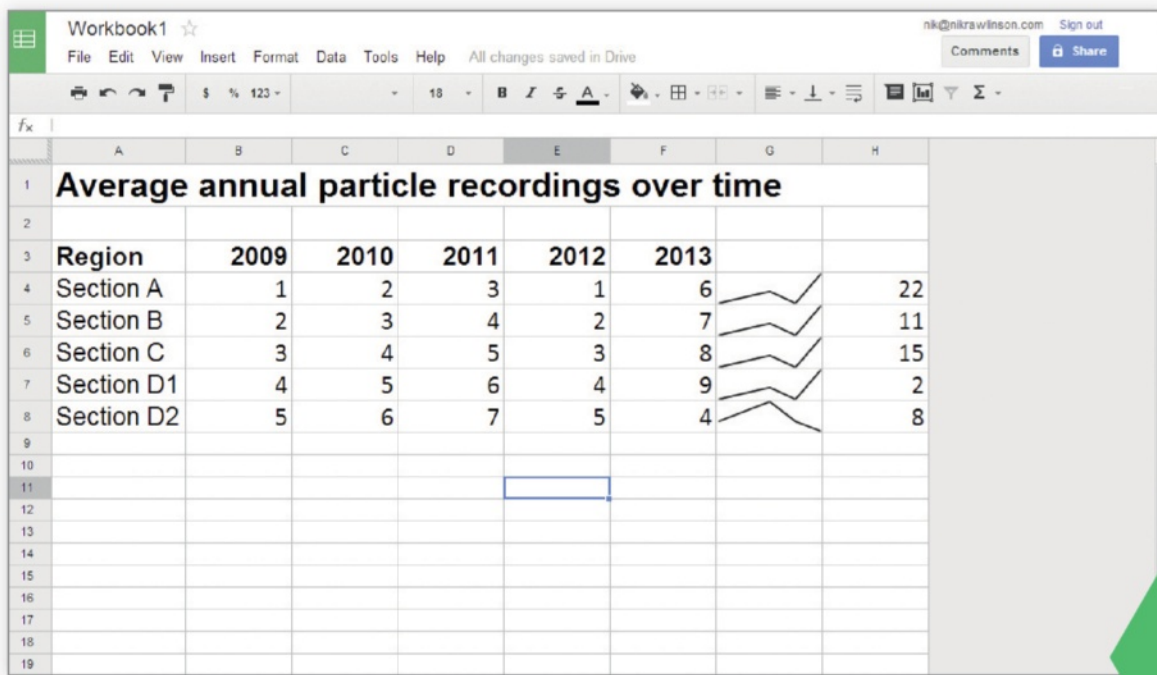
Of course, there's a counter-argument: if you buy a new Mac or iOS device, iWork is bundled, and you can pick and choose which apps you require. Also, you only need to pay for what you use. Due to the lack of an iPad-optimised version of Office, you should consider spending the money on the Apple apps anyway.

Advantages over Office 365

- ✓ One-off cost (or free for purchasers of new devices)
- ✓ Apps optimised for iPad

Disadvantages

- ✗ Poor support for non-Mac devices
- ✗ Mixed compatibility with Office docs



Impressively, the spreadsheet app supports Microsoft Office's sparklines



vs Google Drive

IT'S FREE, IT'S CONSTANTLY IMPROVING, AND IT'S BACKED BY ONE OF THE BIGGEST NAMES IN TECHNOLOGY. DOES OFFICE 365 REALLY STAND A CHANCE?

Microsoft may be champion on the desktop, but online it's been playing second fiddle for years. With no desktop legacy to worry about, Google has concentrated on incremental improvements to its online suite – a core part of its Google-everywhere strategy – and the result is a viable competitor to Office 365. For free.

Over time, Google has built a fully featured word processor, spreadsheet and presentation suite. The apps demonstrate incredible flexibility and a clean, easy-to-understand interface that's less fussy than Office and significantly more attractive than LibreOffice. It even has built-in printing tools, courtesy of Google Cloud Print, which let you send your documents to any remote printer over the web. Try doing that with Office.

Each account comes with 15GB of space for non-native files (Google Document, Spreadsheet and Presentation files have no impact on your overall storage capacity), which can be upgraded to between 100GB and 16TB for US\$5 to US\$800 per month.

You can't use any third-party cloud storage services, but you can link external online apps to your Drive space. Third-party developers have taken advantage of this to bolster Google Drive with features that don't figure in Microsoft's calculations. Tools such as image editors (Pixlr), diagramming tools (Lucidchart) and schedulers (Ganttter) make this one of the most flexible integrated suites on the web.

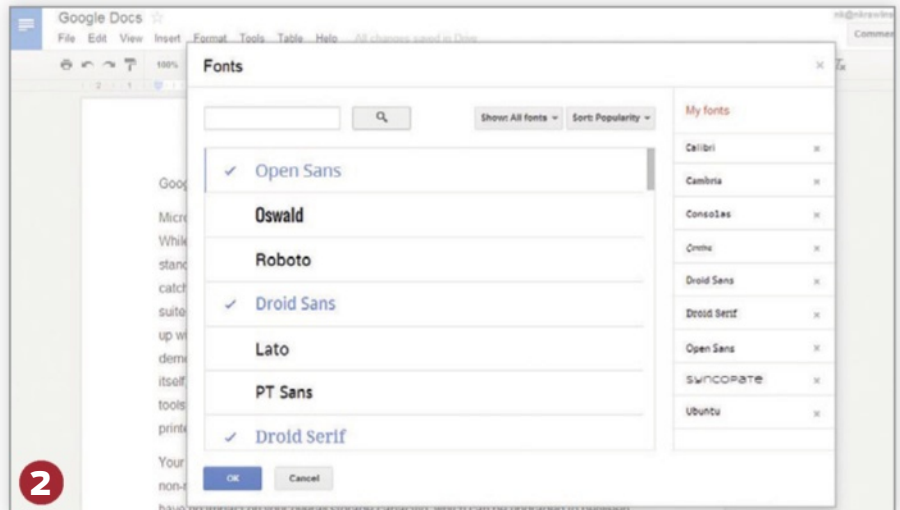
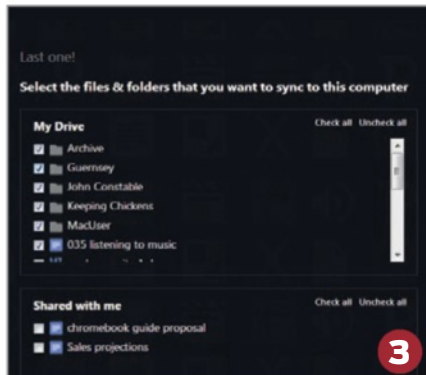
EASE OF USE

Each of Google Drive's three key components is easy to get to grips with, particularly if you have experience with similar offline tools. None of them features a ribbon, but the most familiar formatting options are ranged across a regular toolbar, and they work with common keyboard shortcuts such as Ctrl+B for bold and Ctrl+I for italic. Right-clicking brings up context menus relevant to the application in hand, rather than the regular browser menu, so you can pick spelling alternatives, look up definitions and so on.

The spreadsheet uses common Excel formulae, has a range of built-in chart types and takes conditional formatting in its stride. This last feature, sadly, doesn't extend as far as the in-cell data bars and heat-map colour ranges, so they'll be stripped out if you upload a spreadsheet that makes use of them. Impressively, though, it's fully conversant in sparklines.

The presentation module includes 20 templates in three sizes – 4:3, 16:9 and 16:10 – that make a change from the default PowerPoint layouts. There are only six transition types, but you can build slides object by object to reveal their contents gradually.

It's easy to create great-looking output – complete with images, runaround text and full control over fonts and formatting – and you're not restricted to web-safe options, either, as the apps are tied in to Google Fonts (www.google.com/fonts). This gives you access to 632 open-source typefaces in a variety of weights – far more options than you'd find on the average PC – through a dialog box



- 1 Google Drive has a fully featured commenting system built in
- 2 You can add to the default typefaces by choosing fonts from Google's Web Fonts
- 3 Third-party services such as Insync can synchronise your files with your PC, and convert them to Microsoft Office formats

dissimilar to the Adobe Typekit plugin for Creative Cloud.

LET'S WORK TOGETHER

Google Drive uses bespoke file formats, but conversion to and from their Microsoft equivalents is largely transparent, with an option to translate them when you upload them to the server. At the other end of the process, you can download them in Microsoft, OpenDocument and app-agnostic formats such as RTF and CSV. Google's own synchronisation tool is underwhelming in this area, storing links to your online files, rather than the files themselves on your PC; double-click one to open it in the browser. If

you want to keep real copies of your work on your machine, third-party Insync (www.insynchq.com) plugs the gap, copying your files to your local drive and converting them to Microsoft formats in the process. Any local edits you make are then copied back to the server and converted in the opposite direction to Google formats.

Collaboration is perhaps Google Drive's biggest triumph. It allows you to share documents with read-only or editing rights; opt for the latter and multiple collaborators can open them simultaneously, with amendments highlighted in different colours for each editor.

It's tooled up for collecting data from

third parties, too, even if they're not in your workgroup. The Form tool lets you quickly knock up a web form, the results of which are fed directly into a Google Spreadsheet, ready for analysis. Excel Survey does the same in the Microsoft Web Apps.

There are no Windows or Mac applications that feed their data directly into your Drive files, but the Google Drive mobile app can open and edit these files. It's free on Android, iPad and iPhone.

MAKING THE LEAP

Google Drive is superb value, both in terms of money and time - it's free to use and easy to get to grips with. Microsoft Office old-timers should have no trouble making the switch, while the unthreatening interface is a great starting point for anyone new to the cloud. If you don't need a database and rarely use the more heavyweight features of Office, it's a serious alternative for undemanding users - as long as you're always connected to the internet.

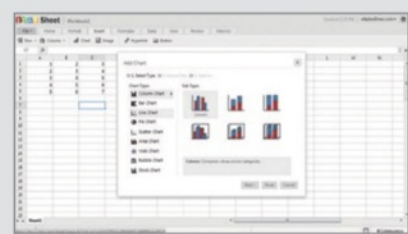
Zoho

Google isn't the only online suite. Another Office rival that's found favour is Zoho, the simple, tabbed interface of which makes it easy to create attractive documents quickly. There's a wide variety of built-in fonts, a format painter, and some smart presentation themes to get you started. Also, an offline feature syncs up to five documents to your browser cache so you can work on them when you don't have an internet connection.

It's easy to share files with collaborators. Amendments are incorporated in real-time, and each user can add and reply to comments. You can create breakpoint versions as you edit your files, review your versions and recover previous editions.

Each free account comes with 5GB of bundled storage, to which you can upload individual files and folders or import your Google Drive files; they're converted and scanned for viruses as part of the upload. Export options run to Microsoft Office, OpenDocument, PDF, HTML and generic formats such as RTF and CSV.

The Zoho app for Android lets you edit Writer files and view or download the others. You can view your files on the equivalent iOS app, but only if you've signed in using a Zoho account - it can't handle OpenID logins using a Google address. If you are tempted away from Office, Zoho is well worth investigating..



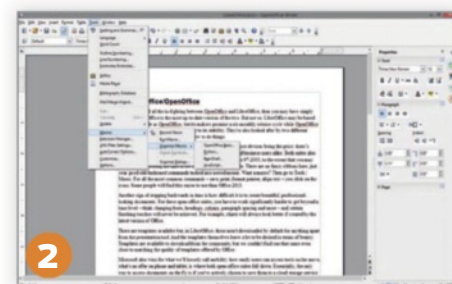
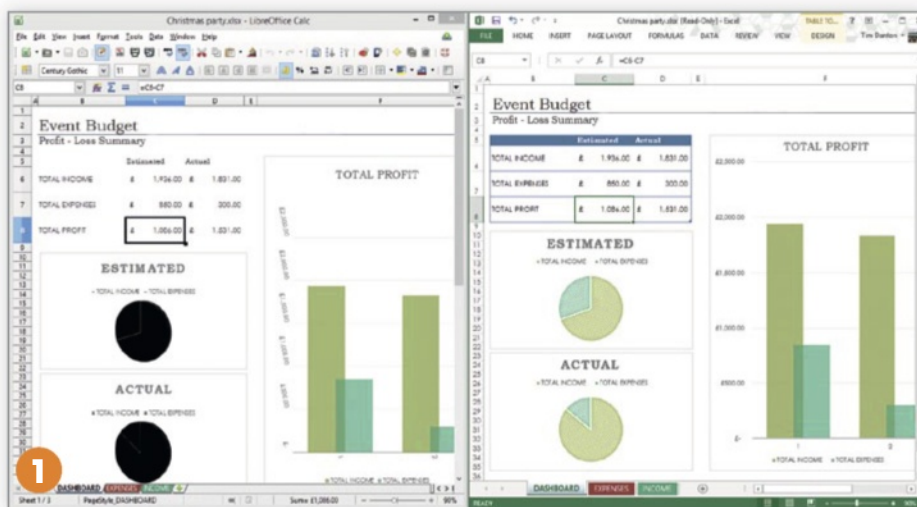
▲ The spreadsheet module includes a range of chart types familiar to Excel

Advantages over Office 365

- ✓ Free of charge and easier to use
- ✓ Superb features for collaboration

Disadvantages

- ✗ Requires internet connection
- ✗ Lacks power and a database tool



- 1 LibreOffice (left) struggles to match Excel 2013 (right) for beauty, since clever formatting is lost in translation
- 2 OpenOffice has recently been updated to version 4; the biggest enhancement is a sidebar that provides quicker control over settings

VS LibreOffice/ OpenOffice

IF YOU DON'T WANT TO SPEND A PENNY, BUT WANT A POWERFUL, FEATURE-PACKED OFFICE SUITE, THESE OPEN-SOURCE OFFERINGS ARE YOUR BEST BET

If the in-fighting between LibreOffice and OpenOffice has passed you by, you may simply have assumed LibreOffice is the most up-to-date version of the two, but that isn't the case. LibreOffice is based on the same code as OpenOffice, but they're now different forks, with different features and release dates.

However, they have far more in common than not, most notably the price: zilch. Both suites also have a similar look and feel that will be familiar to anyone who grew up on Office 97-Office 2003. There are no fancy ribbons here, with LibreOffice relying on good old-fashioned commands tucked into nested menus. Want a macro? Go to Tools | Macro. For all the most common commands – Save, Print, Format Painter, Align Text – you click on the icons. Some people may find this easier to use than the ribbon in Office 2013. OpenOffice has just been updated to version 4, which features a sidebar that lets you control common settings, depending on what you're doing at the time.

The suites' older influences are reflected in the fact that it's difficult to create beautiful, professional-looking

documents. You have to work much harder to get beyond a base level – think changing fonts, headings, colours, paragraph spacing and more – and certain finishing touches are beyond them altogether.

Templates are available, but they leave much to be desired (some date back to 2000); we couldn't find one that even came close to matching the quality of templates offered by Office.

Microsoft also wins for what we'll call mobility. Both open-office suites offer little way for users to access files on the go. Essentially, the only way to access documents on the fly is if you've actively chosen to save them to a cloud storage service such as Dropbox or SkyDrive. Even then, you have to be careful about the format in which you save documents. By default, both suites save to ODF (OpenDocument), which isn't as widely supported as Microsoft's DOCX.

LibreOffice does at least now make it possible to collaborate on documents in a business environment, thanks to support for Content Management Interoperability Services (CMIS).

This standard supports open-source document management systems such as Alfresco, and works with SharePoint, too. Real-time collaboration is off the cards, however, since the system relies on checking files in and out: only one person can make changes at a time, although other people can read the document. The only sense of collaboration comes via comments in your document management system.

Proponents of open-office suites could rightly argue that we're concentrating on what you don't get; what about all the features included for free? This is a huge plus point for both suites. In this brief comparison, we haven't even touched upon the fact there's a fully powered database tool here, as well as Draw, the alternative to Microsoft's Publisher. Of course, not everyone needs to create professional documents, and some businesses may be willing to invest the time and effort required to create good templates.

As with Google Drive, when it comes to calculating value for free software, you should take into account the time spent fiddling with the way your documents look. If your needs go beyond the basics, how much time will you need to spend to add polish to that document, spreadsheet or presentation?

Advantages over Office 365

- ✓ Lots of programs for free
- ✓ Familiar interface for traditionalists

Disadvantages

- ✗ Tough to create good-looking documents
- ✗ Limited tools for collaboration

Do you have the highest standards in security?

So do we.



**Checkmark – the
most rigorous
performance
certification system
in the world**

westcoast labs

USA Headquarters & Test Facility

Irvine, California, USA · Telephone: +1 (949) 870 3250

Europe Headquarters & Test Facility

Cardiff, UK · Telephone +44 (0) 2920 548 400

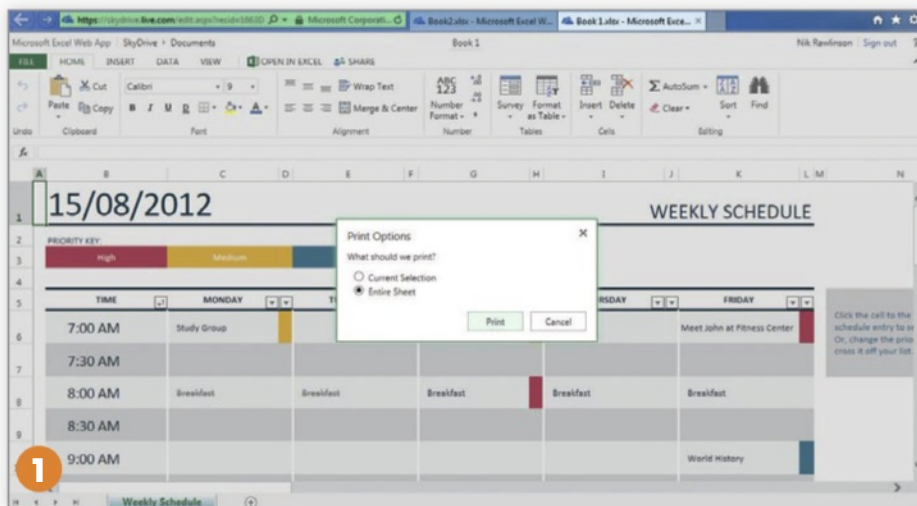
China Headquarters & Test Facility

Beijing, China · Telephone: +86 (0) 10 5890 2501

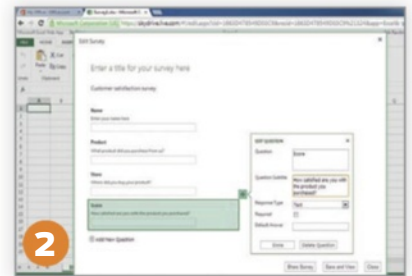
Asia Headquarters & Test Facility

New Delhi, India · Telephone: +91 (0) 11 4602 0622

Full details of West Coast Labs product testing, certification and performance validation services can be found at www.westcoastlabs.com



- 1 The web version of Excel is more flexible when it comes to printing, but Word files first have to be converted to PDF
- 2 The Survey tool lets you put together a questionnaire that feeds data directly into an Excel spreadsheet



VS Office Web Apps

WHAT DO YOU LOSE – AND GAIN – IF YOU ABANDON OLD-STYLE OFFICE FOR ITS ONLINE DOPPELGÄNGER, OFFICE WEB APPS?

Many users confuse the Office Web Apps with Office 365. In reality, they're a complementary service, free for anyone with a SkyDrive account. Paying for Office 365 removes the ads, but at first glance there are few other reasons to pay \$12 per month.

Web Apps comprises Word, Excel, PowerPoint and OneNote, with Outlook

As with Google Drive, you need to be online to use the Web Apps. Nothing is saved locally, although Microsoft does provide 25GB of free online storage.

The Web Apps work perfectly on the iPad, which is useful, since Microsoft hasn't got around to shipping a tablet suite for anything other than the Surfaces. Oddly, Android tablet users

The surprising disconnect between commenting and collaborative editing is therefore as clumsy as it is inexplicable. Anyone who has editing access to a document can read, add and reply to comments – but only in the separate reading view. We prefer Google's cleaner, unified approach.

You'll have to use a workaround for printing from the Word Web App. This involves rendering your document as a PDF, which you can then open in your PDF viewer for printing. It's an inferior solution to Google's Cloud Print service, and far more hassle than sticking with Word on a PC. Excel, on the other hand, lets you output directly to printers.

With Microsoft claiming it's going to beef up Office Web Apps soon, it's an excellent first step if you're a long-term user of desktop Office who's thinking of switching.

“The disconnect between commenting and editing is as clumsy as it is inexplicable”

hosted at www.outlook.com. The Excel Web App is augmented by Excel survey, which, allows you to collect data directly within a worksheet.

The apps' interfaces are near-identical to their offline counterparts, with a slimmed-down ribbon and a generous range of fonts. Familiar tools such as highlighting, preset styles and even right-to-left text have survived the hop to the web, and each app includes a full range of context-sensitive menus on a right-click.)

However, anyone used to the power features in Excel or Word will be frustrated. For example, the Data tab in the Excel Web App is limited to sorting data in ascending or descending order. PowerPoint is limited to four transition styles, with no pre-created templates.

can only view their files via Chrome, rather than edit them, although Microsoft promises a fix is coming. In the meantime, iPhone and Android users can create and edit documents using the free Office Mobile for Office 365 Subscribers apps.

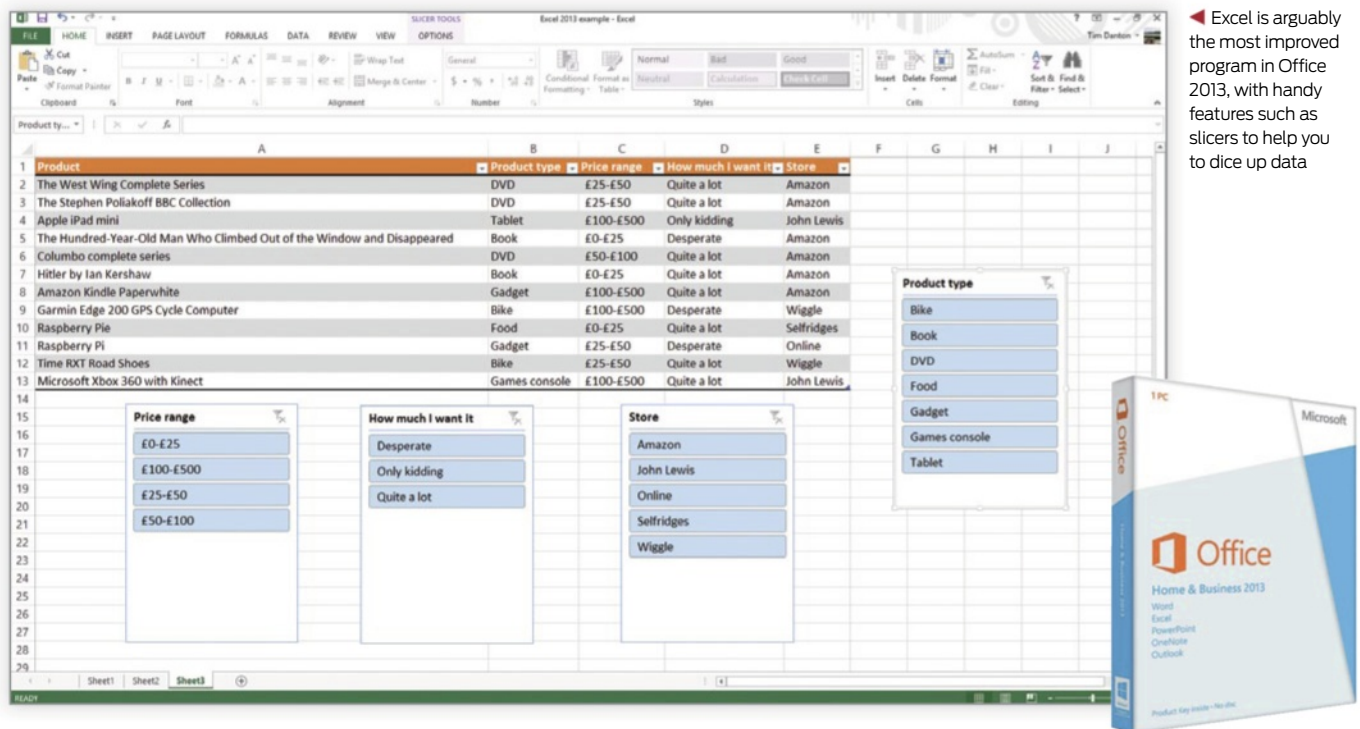
Sharing your work is a breeze. You can either email invites or copy a link to your work into a regular message, and specify which rights the recipients have (edit or read-only), and whether or not they must log in with a Microsoft account. You can also embed read-only versions of a file in a web page, which anyone can view without a password or Microsoft ID. The collaborative editing tools are slick and responsive, with the cursor position updating for each user in real-time.

Advantages over Office 365

- ✓ Free of charge
- ✓ Real-time collaboration

Disadvantages

- ✗ Poor printing options
- ✗ Limited features



Excel is arguably the most improved program in Office 2013, with handy features such as slicers to help you to dice up data

VS Office 2013

MICROSOFT ISN'T STOPPING ANYONE FROM BUYING OFFICE AS A STANDALONE SUITE, SO WHY NOT DO THAT – OR STICK WITH AN OLDER VERSION OF OFFICE?

With Office still available as a suite to install in the normal way, why consider Office 365 instead of Office 2013? For that matter, why shouldn't you stick with an older version of Office, if you already have one on your PC?

OUTLOOK AND LICENCES

One of the biggest problems with Office Home & Student – the main standalone suite offered to home users – is that it doesn't include Outlook. The applications you get with Office 365 University (a four-year subscription available to college students and staff) and Home Premium are equivalent to Office Professional 2013, adding Access, Outlook and Publisher to the usual four of Word, Excel, PowerPoint and OneNote. Business and enterprise subscriptions include Professional Plus, which adds InfoPath and Lync to give you the entire, nine-strong suite.

There's also the number of users and devices to take into account. Office 2013 consumer licences are for one user on one device only; business licences allow this user to install Office on a desktop

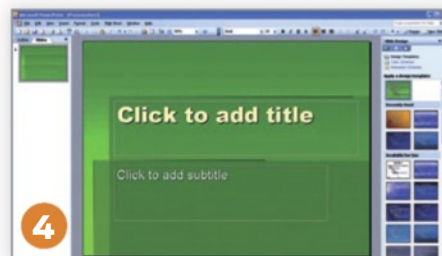
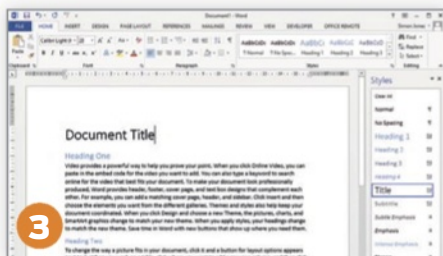
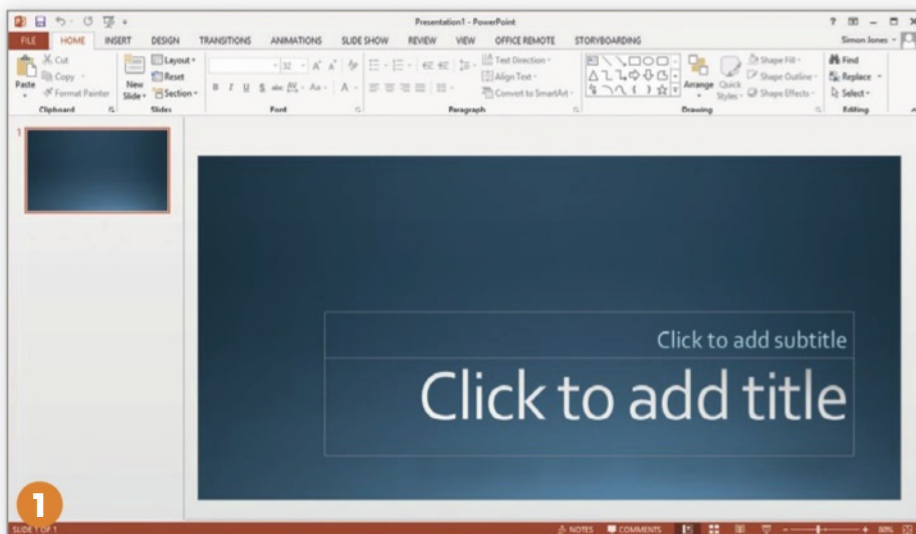
and a laptop; Office 365 lets one user install all the apps on up to five devices. Office 365 Home Premium goes further by allowing up to five users in your household, making it ideal for a family with several PCs, laptops and tablets. It doesn't even matter if you have a Mac or two, since Office 365 lets you run the latest version of Office on those, too. You would have to spend an awful lot

on Office 2013 licences to get the same package offered by a single Office 365 Home Premium subscription. If you're buying for your own use on one PC, it isn't as impressive.

UPGRADES AND EXTRAS

Office 365 subscriptions include updates to new versions of Office as they're released. If you buy Office 2013

OFFICE 2013					
	Consumer		Business		
	Home & Student	Home & Business	Standard	Professional	Professional Plus
Word	✓	✓	✓	✓	✓
Excel	✓	✓	✓	✓	✓
PowerPoint	✓	✓	✓	✓	✓
OneNote	✓	✓	✓	✓	✓
Outlook	✗	✓	✓	✓	✓
Publisher	✗	✗	✓	✓	✓
Access	✗	✗	✗	✓	✓
InfoPath	✗	✗	✗	✗	✓
Lync	✗	✗	✗	✗	✓
Users, devices	1, 1	1, 1	1, 2	1, 1	1, 2
Availability	Retail	Retail	Volume licence	Retail	Volume licence
Price	\$169	\$299	N/A	\$599	N/A



- 1 PowerPoint 2013 templates are more subtle, allowing your content to shine
- 2 Word 2003 documents look cramped and old-fashioned, with frumpy fonts and stark use of black and white
- 3 Word 2013 documents use colour, modern fonts and wider line spacing to make them easier to read
- 4 The templates in PowerPoint 2003 are busy and blocky

through the retail channel, you'll have to shell out again to get the next version. Business customers buying through volume licensing get upgrade rights only if they pay extra for Software Assurance.

Home users of Office 365 get an hour of Skype calls with their subscriptions – covering calls to Skype, landlines and mobiles – and the subscriber can choose how to share this benefit with the other users in their family.

You also receive an extra 20GB of cloud storage through SkyDrive in addition to the 7GB Microsoft gives to everyone free.

BUSINESS SERVICES

You can receive free email via www.outlook.com to go with any Office 2013 package, but Office 365 business subscriptions give you your own domain with addresses @yourcompany.com and tools to administer your email

through Exchange Online. To match the features provided in Office 365 business subscriptions, you'd have to buy, install, configure and run your own Exchange server, SharePoint server and Lync server. The costs of the server hardware, server software and client access licences would be considerable, and you'd need to employ your own skilled administrator, or buy in the services of an IT consultant, since these products aren't easy to manage.

Buying Exchange, SharePoint and Lync online services through Office 365 frees you from the cost of running your own servers in-house, and considerably simplifies the administration (such as letting someone else worry about backups). Keep in mind though that Telstra has been somewhat slow and uninformative when it comes to rolling out major updates to Office 365.

Why not stick with your current version?

Even if you own an older version of Office, one reason to consider shelling out for Office 2013 or Office 365 is the security risk. If you're using Office 2003 – or any older iteration – no new security patches will be published in future, since it will be ten years old in April 2014. As such, the likelihood of vulnerabilities being exploited will increase.

Office 2007 and 2010 are still supported, but there are many new features in Office 2013 that older versions won't be able to edit, even if they can display them. The new default templates and themes in Word and PowerPoint are bright, fresh and easier to read. The main applications save to SkyDrive and SharePoint more easily than before, and they encourage you to share documents by sending a link rather than a whole copy of a document. Excel has new analysis features such as sparklines and slicers, and the Power BI (business intelligence) features make analysing huge datasets easier.

One of the biggest stumbling blocks to upgrading to Office 2013 is the fact that it won't run on Windows XP. However, since XP will become a security problem after support ends in April 2014, you're going to have to take action in any case.



▲ Office 2013 won't run on XP – but support ends soon anyway

Advantages over Office 365

- ✓ Own software in perpetuity
- ✓ Suited to users with one PC

Disadvantages

- ✗ No services for businesses
- ✗ No Outlook in Home & Student

THE VERDICT

Office for home

Microsoft needs to face a brutal reality: as far as most home users are concerned: there are far fewer reasons to stick with the desktop version of Office than ever before. With money tight, it's tough to justify spending \$12 per month on a productivity suite when – as this feature has clearly shown – there are so many high-quality alternatives available for little or nothing.

This isn't to say you won't make sacrifices by dumping the Office suite. It could be power and features, if you opt for an online-only alternative; it could be usability, if you head down the open-source route of OpenOffice or LibreOffice.

However, many people will be willing to make these concessions if they'll save an extra \$144 (or \$119 if you bite the bullet and pay for it all at once) every year in the process.

In our view, Microsoft needs to re-assess the pricing strategy of Office for home users. It could be bundling with ISP services, or making Office 365 free for the lifetime of Windows 8 computers, or simply reducing the monthly price to less than \$5. If Microsoft wants the next generation of children to grow up with Office on every machine they use, something needs to happen.

In the meantime, you have the luxury of choice, particularly since almost all the Office alternatives are free. Take a look at our summary below in each of the key areas and make your own decision. The beauty is you don't have to commit: if you don't like Office 365, Google Drive or iWork, you can always move on to the next option.

Office for business

Many businesses have moved away from Office and been happy with their choice. Whichever switch you make, there are clear savings to be made by removing the cost of Office from your books. In the main, however, most businesses we deal with seem to have stronger reasons to stick with Office, and in particular to shift to the rental model offered by Office 365.

As can be seen from the comparisons in the preceding pages, this isn't a simple matter of inertia. Office has evolved from a bunch of programs that work together into something that offers tangible benefits to businesses. The ribbon interface has its detractors, but how many companies would go back to Office 2003 – even if LibreOffice and OpenOffice offer a compelling facsimile?

The free online alternative – whether Google Drive or Office Web Apps – doesn't yet seem viable. These are excellent complementary services (it's no coincidence that we default to Google Drive when working on collaborative documents), but the quality of the documents they produce, and the fact that you're reliant on an internet connection, means we can't recommend them as a main choice.

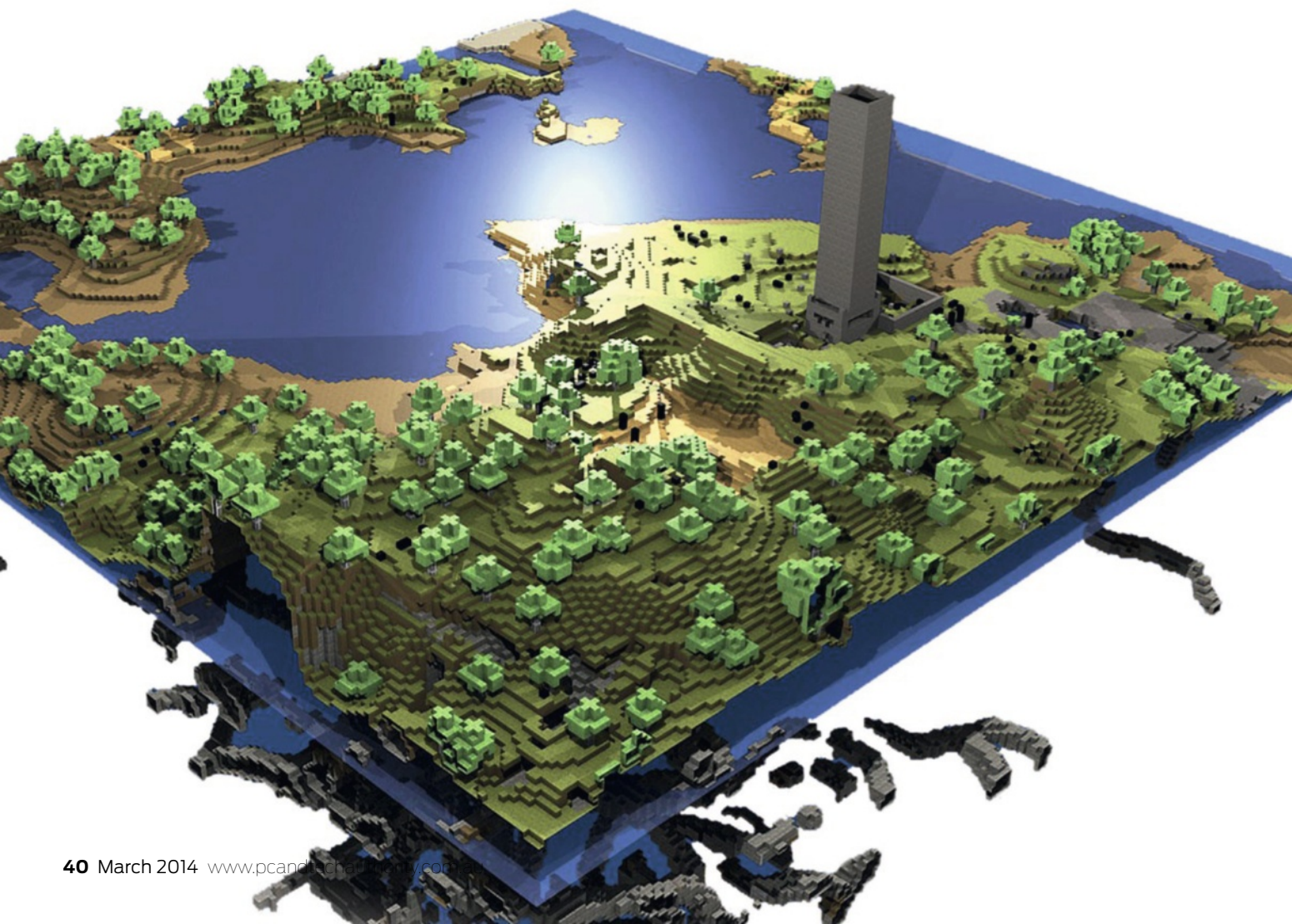
Office remains the best choice for business, and Office 365 wins because it's much more than a subscription version of Office 2013. Of course, it can be just that if you want: an Office 365 ProPlus subscription doesn't include extra services such as SharePoint, Lync or Exchange. Similarly, you can buy a licence for Office 2013 in the usual way. The choice is yours, but Office 365 offers so much more.

WHICH OFFICE PACKAGE SUITS YOU BEST?

	Best for home	Best for business	Office 365* overall
Ease of use	Every product scores highly – there's no standout option. If you loved Office 2003, you may like the similar-looking LibreOffice.	Sticking with what you already have minimises training needs, but the quality of documents that staff produce may suffer in the long term.	A minority still don't like the ribbon interface, but wherever you use Office 365 – on the phone, desktop or browser – it's easy to understand.
Mobility	Office 365 is the best all-rounder, but iWork is a better choice for anyone who's committed to Apple's products.	Even with mediocre tools for Android and iOS, nothing can match Office 365 for access to documents on the move.	A strength, due to the fact that you can edit documents on virtually any device without losing formatting.
Collaboration	Google Drive is the outstanding choice, but newly-improved Office Web Apps is hot on its heels.	Office 365 wins: it's never been easier to collaborate within your business – and with anyone outside.	As long as you share on SkyDrive, Office 365 is a great choice for collaboration (even if you switch to Office Web Apps for real-time editing).
Document creation	We like iWork, but Office 2013 is the best choice for most people: you can achieve great results quickly.	Office 2013 (and Office 2010) will help you create brilliant-looking documents, spreadsheets and presentations – only iWork comes close.	By always having the latest version of Office on your or your employees' desktops, you can be sure that you can create beautiful documents quickly.
Value for money	You're spoilt for choice, but we recommend giving all three online suites – including Zoho – a try. They're free, after all.	Office 365 isn't cheap, but arguably it's worth every penny for businesses, especially if you'll take advantage of hosted email, Lync Online and SharePoint Online.	This is the biggest question mark for Office 365: for home, we're unconvinced, but it's surely a sensible investment for most businesses.

BLOCK PARTY

BOXY GRAPHICS, CLUNKING SOUND EFFECTS AND NO END GOAL. WHAT IS IT THAT'S ATTRACTED 33 MILLION PEOPLE TO MINECRAFT? **BARRY COLLINS** FINDS OUT



It's a humiliating rite of passage for any modern parent: the moment your child teaches you how to play a computer game, not the other way around. In my case, it was Minecraft, the Quake III cum Lego set that has gone from an unknown indie game created by a Swedish developer called Notch in his spare time to rack up more than 33 million sales in only four years.

By and large, PC games leave me cold, but what caught my attention about Minecraft was how infatuated my nine-year-old had become with it. She would spend hours on her mother's Android tablet, building houses, castles and farms. What was most extraordinary of all was that she was only playing the demo version: she couldn't save any of the fantastically elaborate creations she had spent so long crafting. It was the equivalent of building a city out of Lego, dismantling the bricks, and starting again from scratch the next day.

What is it about Minecraft that's captured the attention of millions around the globe? And not only nine-year-old girls, but grown adults who attend international Minecraft conventions, and the parents of autistic children, who set up their own Minecraft server just so their kids are able to have somewhere safe to express their creativity, with genuinely staggering results. I've delved into the blocky, primitive world to find out.

STAYING ALIVE

At first, it's hard to see the attraction of Minecraft. Starting in single-player mode on a PC, you're presented with a choice of Creative or Survival mode.

The first gives you all the tools you need to start creating anything your imagination can muster, without any threat to your existence; the latter drops you into a random landscape with nothing but your fists, and gives you ten minutes to scrape together a shelter before zombies appear at dusk to throttle you. Being the happy-go-lucky chap that I am, I naturally opt for the latter.

Within minutes, I'm smashing away at the side of a mountain, trying to build a cave that I can later block up the entrance to and stay safe. Having yet to gather enough resources to create a torch, or indeed a bed in which you can lie and accelerate through the night, I'm forced to block up the cave door and sit there doing nothing for the next ten minutes of in-game nighttime, lest I go outside and end up in a scrap with a zombie. Without weapons, this would be like Tom Cruise picking a



fight with Mike Tyson. It has to be the dullest, bleakest opening to a game ever: I'm standing there doing nothing in darkness, interrupted only by the agonised moans of passing monsters. Millions pay for this?

Slowly, however, the appeal of Minecraft reveals itself amid the relentless self-preservation. Dawn breaks, and I begin smashing wood and stone with bare hands to gather materials and make tools, so that I can smash those trees and rock-faces faster. My hunger bar is starting to dip worryingly, so I punch a passing cow to death and make off with two beef steaks and a hide of leather (don't worry vegetarians, you can survive on apples and bread if it's more than your conscience can bear). I craft a bed, a furnace, and a chest in which to keep my goods, and with torches flickering up the walls, my depressing little cave is starting to feel almost homely.

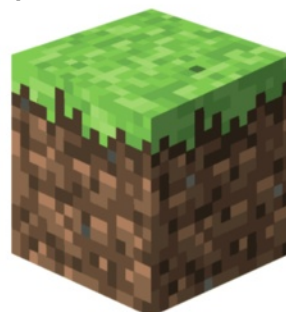
Before long I'm planting seeds, harvesting wheat and using it to tempt animals into my pen. Well, I say pen; it's more of a waist-high wall. It's then I make the startling discovery that cows can jump. I'm forced to smash more stone and build a bigger pen/dungeon to breed cows in, purely so I can keep the burgers flowing. And all this before dusk, so I can avoid being killed by the crossbow-wielding skeletons that have

started to creep onto the horizon. It's engrossing and fun of a sort, but if I'm being honest, this constant graft for survival feels a little too much like a day job.

THE MINECRAFT BUSINESS

Minecraft occasionally feels like work, and it's certainly big business. Aside from the revenue developer Mojang would have earned from 33 million game sales - it costs €20 for the PC and Xbox version, and \$7.50 for the more limited Pocket Edition on smartphones and tablets - Minecraft is an industry of its own. There are firms making good money from hosting multiplayer Minecraft servers, which allow players to team up to build together or fight one another. A virtual server capable of supporting 58 players simultaneously costs US\$45 per month from MCProHosting (<https://mcprohosting.com>), and the company isn't short of customers or competitors.

Then there's the merchandise (official or otherwise), guidebooks and associated goods. And then there's the advertising revenue generated from the thousands of YouTube video guides, explaining how to build this or that in the virtual world. The scarily enthusiastic "stampylonghead" has more than half a million subscribers for his daily 20-minute long video guides, a single episode



of which has generated 2.4 million views (<http://youtu.be/2w4zzVPJ4WU>), earning him a tidy sum, no doubt.

Minecraft even supports its own international convention every year. More than 7500 people attended the last MineCon in Florida, in November 2013. The first batch of 2500 tickets sold out in three seconds, according to a tweet from Mojang's chief operating officer, Vu Bui (@vubui).

Simon White, a 21-year-old software engineering student, has volunteered for the past couple of MineCon conferences. "The one thing about Minecraft is that the community is so unique. There have been so many businesses and lives changed because of one single game," he told *PC&TA*. "The community is brought together [at MineCon]. There are panels and talks about different aspects of Minecraft, a gaming area/LAN where people can chill out and relax and, of course, there are the exhibitors, which range from servers to clothing companies."

In contrast to my fears about the game becoming a chore, he says it's the sheer variety that keeps bringing him back - he spent more than 100 hours playing Minecraft in 2013, either in single-player mode or on the Mineville servers (www.themineville.com). "Originally it was the fact you had complete freedom to do whatever you wanted, and you could make the game/world your own," says White, describing what attracted him to the game. "One of the main things that keeps me interested is that it's constantly being updated - almost weekly - so there's always something new or different to discover."

Unlike the other goliaths of the

gaming world - Call of Duty, World of Warcraft or the FIFA soccer series, say - there's an educational side to Minecraft, too. Whether it's learning the principles of farming, or getting to grips with economics by trading resources with villagers, or programming logic gates by setting doors to open when a certain combination of buttons is pressed, there's more to Minecraft than hacking at zombies.

Indeed, some of the intricate architecture and in-game objects designed - brick by brick - by children are awe-inspiring. Take this video (<http://youtu.be/VzjvdTwiYvY>), in which a child describes how he made a working escalator. He prototypes different designs, learns from the failure in his early models, adapts the type of piston used to power the escalator, and finally cracks the

problem. The kid should be top of every engineering firm's scholarship list.

Schools aren't blind to the educational benefits of Minecraft, either. Santeri Koivisto is CEO of TeacherGaming, a Finnish company that sets up Minecraft servers for schools around the world. The customised version of the game provides special features and tools for teachers, such as a library of pre-built levels and activities, the option for teachers to "freeze" students' games so they can command attention in the classroom, and - critically - a licensing model that means schools don't have to pay for 30 individual licences. A 25-seat licence would cost schools around €250 from MinecraftEdu.com, a fraction of the cost of individual licences.

Koivisto says he's seen Minecraft used to teach pupils of all ages and abilities, across a variety of subjects, including maths, geography, history and social studies. "One teacher nailed it," he says. "After the [Minecraft] class, the key thing he did was ask from the students 'what can we teach from this game? Write it on a note and bring it tomorrow.' None of the kids wanted to leave school that day. They all wanted to stay and write the notes."

Koivisto says the key to Minecraft's ability to capture pupils' attention in

Some of the Architecture designed by children is awe-inspiring

the classroom is that children don't regard it as a stuffy piece of educational software, but a game they're happy to play in their own time. "When kids play an 'educational game', it doesn't deliver the same fun and joy, and then it fails to deliver the interest," he says. That's why his company has steered clear of attempting to influence the future development of the game. "Mojang is focusing on the fun. We're the people concentrating on the education side. We don't want to ruin the game. The last thing we want to do is make the game stink like school."

AUTISTIC ARENA

Minecraft is also the perfect outlet for autistic children to express themselves. Amanda Osborne's eight-year-old son Callum is autistic, and instantly fell in love with an "endless world where you can do whatever you want". However, she was worried about letting Callum play on regular Minecraft servers because she'd "heard





▲ Farming – and brutally slaying – animals is one way to feed yourself in Minecraft

a lot of rumours about bullying and swearing” – rumours that are entirely accurate, in my experience. Within ten minutes of joining my first online Minecraft server, I found myself locked in a virtual prison as a gang of fellow players built walls around my character and bombarded me with foul messages. It was fairly amusing stuff, but not so funny for a young child that has difficulties communicating.

So Osborne, who already runs her own support website for parents of autistic children (www.aplacetotalkaboutautismadhd.co.uk) decided to set up her own Minecraft server specifically for autistic children. She and her husband Mark now spend “countless hours” every week moderating their invite-only Minecraft world – making sure fights don’t break out between players, ensuring that there’s no bullying, and offering guidance and support to children from around the world.

The couple give me a tour of their Minecraft world one Friday morning. They have to open the server especially for me; it’s normally shut down during the daytime, out of fear that the children will skip school to play. The server has been running only for two-and-a-half-months, yet the scale and intricacy of what the children have built is truly staggering. There’s an enormous fort where the children are allowed to battle against monsters (player-versus-player combat is banned, in order to minimise disputes);

a supermarket where they can sell the in-game goods they make for virtual currency; a winding racecourse where the children can leap on a horse in the stables and race one another round the steeplechase track, complete with a winner’s podium; and a two-storey school with lots of individual classrooms and lecture halls, where the adults deliver lessons. Aside from these communal buildings – all built co-operatively by the children themselves – each child has their own private island, where only they are allowed to build, ensuring that nobody can come along and ruin their creations.

Osborne says the sheer creativity and scale of what the children build regularly move her to tears, but even more impressive than the architecture is the sense of community and belonging the children attach to this Minecraft world, which is evident even without them being present. She takes me to a room where children who are unhappy for whatever reason can post private messages to adult moderators, and are encouraged to feel better about themselves by answering questions plastered to the walls such as “My talent is...” or “I make people happy by...?”. Once they feel better, they walk through to the “happy room” and can leave messages of encouragement of their own. Elsewhere on the map, there are plaques erected for the players of the week, and an enormous statue of Peppa Pig built by the children, with a speech bubble containing the sentence: “We love you CJClow Mummy” – that being Osborne’s in-game username.

Last November, she tells me, they even held a fireworks party, for which the children designed and created all the virtual pyrotechnics. For some of them, it was the first fireworks party they’ve ever been able to attend, “because they can’t go to such events” in the real world.

If there’s ever been a more worthwhile purpose to a computer game, I’ve never come across it. ■



▲ Autistic children use Minecraft to socialise in ways they simply can’t in the real world

10 TIPS FOR MINECRAFT BEGINNERS

- 1** Read up first. Minecraft isn’t an easy game to pick up as you go along, and there’s no in-game tutorial. There are several excellent online resources that show you how to get going, harvest resources and build tools, but the best is the comprehensive Minecraft Wiki at <http://tinyurl.com/nl6tne4>.
- 2** Get to cover! If you’re playing Survival mode for the first time, the most important thing is to create yourself an enclosed shelter to survive the first night’s zombie attacks. You have ten minutes.
- 3** Once you’ve established a home base in Survival mode, the biggest danger is getting lost and not being able to find it again. Create waypoints back to base when you go exploring. Build a tall tower with torches at the top next to your base, so you can always spot home from a distance.
- 4** Creative mode, in which you have unlimited resources, can’t be killed and can fly around maps, is a far gentler introduction to the game, especially for children.
- 5** Change the default “drop item” key from Q. Minecraft uses the standard W/A/S/D keyboard controls, and it’s all too easy to accidentally strike Q and drop your sword mid-melee.
- 6** “There’s so much to do within Minecraft I’d suggest you try a little bit of everything,” says Minecraft devotee, Simon White. “From single-player worlds to player-versus-player (PVPing) with friends.”
- 7** Don’t discard tools that are close to wearing out (each tool has an energy bar). They can be fixed by placing two tools of the same type next to one another on a crafting table.
- 8** Build a chest in your base as quickly as possible, and use this to store a selection of essentials, such as weapons, food and resources. That way, if you’re killed and can’t quickly return to the death scene to pick up your dropped goods, all is not lost.
- 9** Trees aren’t only sources of wood. Hack away at the leaves and they might drop an apple, which should provide enough food to keep you alive for the first few days.
- 10** Don’t pay for access to a multiplayer server right away. Check out if you enjoy the experience first by playing on a free server. Enter “play.gotpvp.com” into the server address field to experience a free multiplayer server that hosts games in a variety of modes, and gives you your own island space to build in Creative mode.

IN THE LABS

YOU WON'T FIND
BETTER REVIEWS
ANYWHERE
IN AUSTRALIA!

Love in the labs

DAVID HOLLINGWORTH HAS BEEN REMINDED THIS MONTH THAT EVEN A JADED REVIEWER IS CAPABLE OF TRUE EXCITEMENT OVER A NEW PRODUCT.

One of the true pleasures of reviewing hardware is the rare piece of kit that, from unboxing, through reviewing, and then into actual every day use, just gets better and better. In a perfect world, we understand that we need to be as objective as possible, but often, that's a very hard proposition. After all, as well as reviewers, both John and I are technology and PC enthusiasts; we love what we write about it.

Personally, I think it's more of a strength than a weakness. And I think you'll likely agree when you look at John's glowing review of Corsair's new Mini-ITX case this month, on page 48. To be blunt, he loves it, thoroughly and unreservedly.

The thing to remember, though, is that this is no mere flash in the pan. John first heard whisper of the case

at Computex last year, and take my word for it when I tell you it's been something he's been looking forward to spending more time with since then – he's certainly made that plain to me in numerous office conversations and Labs pow-wows.

In fact, that makes his continuing respect for the hardware – and yes, it is a great piece of kit – even more impressive. It's very easy for expectation to be let down by reality, but John's already planning his next build around it.

I guess what I'm trying to say is that when you spot any reviewer really loving something, think about what a generally cynical bunch we are. But also remember that we're just like you.

So, anything we really get excited about is probably going to be something worth paying attention to.

DAVID HOLLINGWORTH

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



WHAT OUR A-LIST MEANS

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



WHAT OUR AWARDS MEAN

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



WHAT OUR RATINGS MEAN



OUTSTANDING
VERY GOOD
GOOD
ORDINARY
POOR
VERY POOR

HOW WE TEST



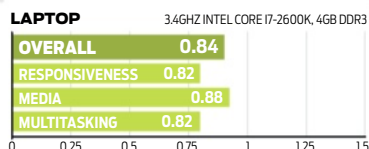
OUR BENCHMARKING TESTS ARE THE BEST IN THE BUSINESS. READ ON TO FIND HOW THEY WORK...

2D TESTS

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

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

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



3D TESTS

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

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



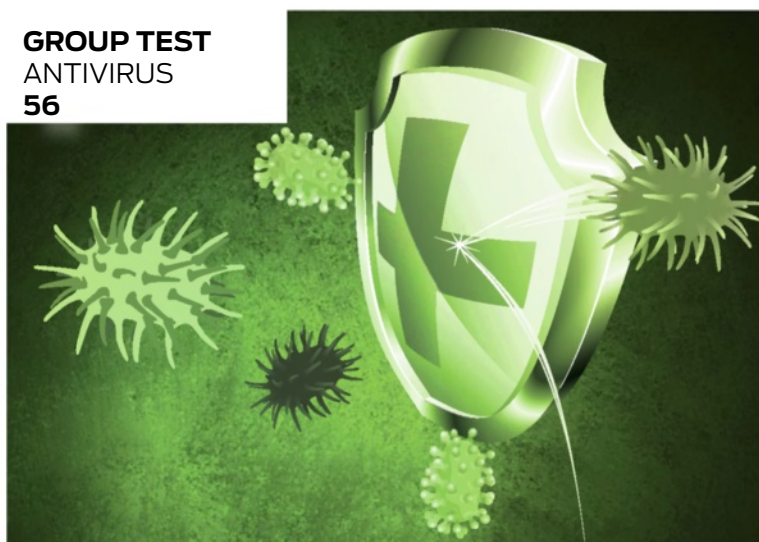
LAPTOP BATTERY LIFE

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

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



GROUP TEST ANTIVIRUS 56



REVIEWED THIS ISSUE...

PERIPHERALS

Bitfenix flo.....	54
Microsoft Wireless Mobile 3500 Mouse	54
Steelseries Stratus.....	55

COMPONENTS

Corsair Obsidian 250D	48
Asrock Fatal1ty Z87 Killer	54
Corsair Hydro H105	54

SOFTWARE

Steinberg Cubase 7.5.....	51
Inkredible.....	52
Choicemap.....	52
Pandora Internet Music Radio.....	53
Quit your job	53
1stAvailable	53
Confide	53
Avast Free Antivirus 2014.....	60
Eset Smart Security 7.....	61

Kaspersky Internet Security 2014.....	64
Norton Internet Security	66
AVG AntiVirus Free 2014.....	67
Bitdefender Internet Security 2014.....	67
McAfee Internet Security 2014.....	68
Microsoft Windows Defender.....	68
Trend Micro Titanium Internet Security 2014.....	69
Norton Mobile Security.....	62
Eset Mobile Security & Antivirus ..	63
Qihoo 360 Mobile Security	63
Trend Micro Mobile Security & Antivirus	63

GAMES

DayZ Early Access	72
-------------------------	----

HANDHELDS

HTC One MAX.....	46
Nokia Lumia 1520.....	47
Lenovo Yoga Tablet 8	55



HTC ONE MAX

GREAT SCREEN, BUT THE PHONE'S PERFORMANCE AND CAMERA COULD BE BETTER

PRICE \$888
SUPPLIER www.htc.com

A current trend for smartphone manufacturers is to take their latest high-end model and make it larger, perhaps with extras such as a stylus. With the One Max, HTC seems simply to have made a bigger, more expensive HTC One.

The One Max certainly looks similar to the smaller model. However, while the HTC One has a unibody design that doesn't open, the One Max has a removable aluminium rear cover. Strangely, you still can't replace the battery, as the cover just gives access to the microSD card and SIM slots. This means you lose the neatness of a unibody design without gaining the flexibility of being able to replace the battery, which is a pity. You wouldn't need to carry a spare, though, as the One Max lasted for a huge 15 hours 45 minutes in our video battery rundown test, but it will limit the handset's useful lifespan.

Nestled under the camera at the rear is a fingerprint reader. This works differently to the reader build into the iPhone 5S, which can unlock the phone and authorise purchases from the App Store. The One Max's reader can learn up to three different fingerprints, and you can use them to unlock the phone, or unlock it and launch an app. We found the fingerprint reader's position on the back of the phone less convenient than that of the iPhone 5, which is on the front, but it's still a more secure way of unlocking a phone than using a passcode or unlock pattern. The One and the One Max have the same core components, with quad-core Qualcomm Snapdragon 600 processors running at 1.7GHz and 2GB of RAM. This offers performance that, while strong for early 2013, now looks decidedly mid-range. The One Max completed the SunSpider JavaScript benchmark in 1182ms, which compares poorly with the 706ms of Google's Nexus 5.

Sadly, the One Max was unable to run Android 4.3 with the same effortless smoothness we've seen on Snapdragon 800-powered smartphones. The animation when

opening the app tray is slightly jerky, for example.

In the 3DMark benchmark, the One managed 6928 in the Extreme test, which is low compared with the Xperia Z Ultra's 17,899. The One Max is still significantly quicker than Samsung's Galaxy Mega, which scored just 2782 in the same test. We certainly noticed the One Max's slower 3D performance in games. Real Racing 3 was noticeably less smooth than it was on a Google Nexus 5, for example.

We're fans of the HTC One Max's Full HD LCD screen. The resolution works well on such a big screen, making headlines, standfirsts and captions on web pages easy to read when zoomed out. This is also possible on 5in 1080p displays, and even on the 1280x720 display of the Galaxy Mega, but it's easier on the One Max. We liked the display's colour balance best at maximum brightness, as it was slightly too cool at lower levels. Compared with the Google Nexus 5's screen, the One Max's has purer whites, with none of the Nexus 5's slight yellow tinge.

The large display is great for watching films, and the forward-facing stereo speakers are loud and good, so you don't necessarily have to use headphones. We enjoyed watching YouTube clips of stand-up comedy shows, but the lack of bass and thin mid-range means the speakers aren't best suited to music. The One Max has a 4-megapixel camera, which is far fewer pixels than the 8- or 12-megapixels we usually see on modern smartphones. When HTC launched the One, it claimed that the sensor uses what it calls Ultrapixels, which are bigger than typical smartphone sensor pixels and capture more light, helping the camera perform better in low light.

The One Max certainly takes impressive low-light shots. However, we weren't impressed with its daylight images, which were well exposed but lacked detail. They were far below the standard we expect from even a budget smartphone. The One Max is a phone to avoid if you're even vaguely serious about photo quality.

Whether or not you want such a big phone is a matter of personal

KEY SPECS

Android 4.3 • Quad core 1.7GHz • 2GB RAM • 4G • 5.9in 1920x1080 LCD display • 4-megapixel camera • 16GB storage • MicroSD card slot • 28 hours talk time, 24 days standby • 165x83x10.3mm • 217g



taste. With a 6in smartphone you really don't need a tablet, as it's perfectly big enough for casual web browsing. However, the One Max did poke out of our jeans pocket, and we often couldn't sit comfortably unless we removed it. The One Max isn't particularly comfortable to hold for long phone calls, either, and using the touchscreen one-handed isn't really practical.

The HTC One Max is a reasonably impressive example of a super-sized smartphone. We like the design, the screen and the battery life, but the phone's performance doesn't match its premium price, and the camera is substandard. We'd be tempted to save some money and find a grey imported Samsung Galaxy Mega instead. However, the Samsung Galaxy Note 3 is still king of the monster phones.

Chris Finnamore

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

OVERALL ★★★★★

NOKIA LUMIA 1520

A BIG, BEAUTIFUL SMARTPHONE WITH A SUPERB DISPLAY, CAMERA AND GOOD BATTERY LIFE TOO – BUT IT'S PRICEY

PRICE \$600
SUPPLIER www.nokia.com

Android fans have plenty of choice when it comes to super-sized smartphones, but those on other platforms have, until now, been stuck with screens below 5in. The Nokia Lumia 1520, with its huge 6in, Full HD display, fills that gap for Windows Phone users.

Whether or not the gap needs filling is up for debate: some say having such a large screen means easier typing, more comfortable web browsing and a more enjoyable gaming experience; others find such devices hip-jabbing, pocket-splitting comedy phones, too impractical for everyday use.

Whichever side you come down on, though, there's no doubting the Lumia 1520's top-end credentials. It may be large, measuring 86mm wide and 193mm tall, and weighing 209g, but its slim profile and elegant lines make the most of the situation.

In common with much of the Lumia range, this is a beautifully made piece of hardware: its brightly coloured, matte-plastic finish feels silky in the hand; there's scratch-resistant Gorilla Glass 2 on the front; and the whole thing feels built to last.

There's even a modicum of practicality: the Lumia 1520 sports a microSDXC card slot, which allows you to boost the storage from 32GB to 96GB. There's also support for 4G and wireless charging, as well as NFC. The internal battery cannot be user-replaced, however.

All-round performance and specifications are just as good. Under the hood is the popular quad-core Qualcomm Snapdragon 800 CPU, clocked at 2.2GHz and backed up by 2GB of RAM. This is enough to attain top results in all the benchmarks we ran: it recorded an average time of 537ms in SunSpider, and 25fps in the graphics-heavy GFXBench 2.7 T-Rex HD.

Windows Phone 8 runs flawlessly and games play smoothly. The 6in display also means you can squeeze more onto the Windows Phone homescreen: where the 4.5in Lumia 1020 can show two columns of the larger, square tiles, the Lumia 1520 can display three.

The quality of that huge display is excellent. Colours pop off the screen at default settings, but it's possible to adjust the overall colour temperature and saturation if you crave a more sedate or vivid palette. Although the maximum brightness isn't up with the best we've tested – we measured it at only 366cd/m² – Nokia's ClearBlack polarising filter technology does a great job of keeping the screen readable in the brightest sunlight.

The Lumia 1520's camera, which is a 20-megapixel PureView unit, is also pretty good; it works in a similar way to the 41-megapixel snapper on the Lumia 1020. It captures a 5-megapixel shot and a full-resolution photo at the same time, allowing you to recrop images after shooting and making snaps easier to upload. There's also optical stabilisation, which smooths out video and allows for sharper shots at slower shutter speeds.

There's a dual-LED flash for in-the-pub snaps; and the Nokia Camera software gives advanced access to ISO, shutter speed, white balance and exposure compensation. The handset also sports four microphones, in theory boosting audio quality in video.

These are impressive specifications, and the camera is at least as good as the Lumia 1520's main rival, the Samsung Galaxy Note 3. If anything, low-light shots are slightly sharper, and exposure of photos and video is well judged. The audio, captured by the quad-microphone array, is superb – full of body and depth.

However, if you were expecting anything approaching the quality of the Lumia 1020, you will be disappointed. The Lumia 1520's smaller 1/2.5in sensor means that



▲ The 6in display allows you to squeeze more onto the homescreen



KEY SPECS

Quad-core 2.2GHz Qualcomm Snapdragon 800 • 2GB RAM • 32GB storage • 6in 1080 x 1920 IPS display • 4G • Bluetooth 4 • NFC • Qi wireless charging • dual-band 802.11n Wi-Fi • 20MP/1.2MP rear/front stills • 1080p video • 3400mAh battery • Windows Phone 8 • 86 x 9.5 x 193mm (WDH) • 209g

low-light photos look much murkier and more smeary.

Battery life, on the other hand, is excellent. The larger chassis gives Nokia the opportunity to jam in a bigger battery, and the Lumia 1520's 3400mAh unit delivers stamina to rival the Galaxy Note 3. In our 24-hour test, in which we carry out a set of repeatable tests – a 50MB data download, a 30-minute phone call, an hour of screen-on time and an hour of audio playback – it retained a superb 70% on the gauge.

All in all, the Nokia Lumia 1520 is an excellent smartphone and the most powerful and rounded Windows Phone handset we've seen. It retains Nokia's refined sense of design, and includes the excellent selection of Nokia and Microsoft Office apps. It combines all this with a stunning screen, good battery life and a camera that is highly accomplished.

The Samsung Galaxy Note 3 remains our favourite large-screen smartphone – its smaller size and stylus make it a more practical choice, and Android still delivers a wider choice of apps than Windows Phone – but this Lumia runs it a close second.

Jonathan Bray

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

OVERALL ★★★★★

CORSAIR OBSIDIAN 250D

THE FINEST MINI-ITX CASE TO EVER PASS
THROUGH OUR TESTING LABS

PRICE Local price TBC (US \$89.99)
SUPPLIER www.corsair.com

Over the past year we have been seeing a massive change in the way the component industry looks at the Mini-ITX form factor. Mini-ITX no longer means low power and extremely limited component choice – nowadays you can build a high end desktop in a tiny form factor, without too many compromises.

While we have seen many case manufacturers come out with Mini-ITX designs, nothing has managed to capture our imagination like Bitfenix and its Prodigy, the case that in many ways kicked this revolution off.

Until now that is, for the Obsidian 250D from Corsair is the first product we have seen that has even a chance of giving the Prodigy a run for its money. In fact, we would go far as to say that the 250D has knocked it off the perch as our favourite Mini-ITX case.

It does so by taking the same overarching philosophy as the Prodigy, but then delivering it in true Corsair style. Despite its small dimensions the 250D can fit a full sized PSU, long graphics card, multiple drives and a dual radiator cooler like Corsair's H100 series. To be fair, we're seeing more and more case manufacturers attempting to incorporate these kinds of features, but none have done it with the style and flair that Corsair has.

The overall design is reminiscent of the gigantic Obsidian 700D and 800D models, with black metal panels, straight lines and a subdued but stylish front panel designed to ensure the incoming airflow is as unimpeded as possible, while still hiding any unsightly fan grills. The front panel also sports two USB 3 ports, audio in and out and a hinged panel designed to allow you easy access to a removable filter.

We love the restrained look of the



case from the outside, but it was once the panels came off that a slightly embarrassing explosion of geeky enthusiasm spread through our corner of the office. Not only is the 250D designed to fit all kinds of componentry, but it is abundantly clear that a lot of thought has gone into dealing with making components accessible once installed. This is a stark difference from the tight integration of most Mini-ITX cases, in which accessing RAM or drives can be an experience akin to a few rounds of blindfolded Tetris.

Not only does the motherboard plate have a hole in it, designed so you only need to slide out the power supply to change cooler mounts, but the power supply cage itself is open-ended, allowing for varying lengths of supply to be used (one of the slightly annoying things about the Prodigy is that the cage can make some PSUs tricky to work with). In order to create this space Corsair has made a very smart decision to put the hard drive cage between the PSU and the side panel, rather than up near the front panel.

To access your hard drives you actually remove a grill from the rear of the chassis, exposing the drive cage. This cage holds two 2.5in drives and



two 3.5in drives, which is an ample amount for most desktop PC uses, especially when you consider that most Mini-ITX motherboards only sport four SATA ports. We were initially disappointed that Corsair hadn't gone the extra mile and incorporated a hot plug backplane into the drive cage – you still need to hook up SATA and Power cabling to each drive, but in reality, the positioning of the drive and PSU cages mean that there is a lot less clutter inside the case itself and hence cabling up these drives is quite simple.

The real design intent for the drive cage seems to stem from two very practical considerations, and has some nods to the philosophies behind Corsair's airflow focused Carbide Air 540 case. By aligning the drive cage front to back Corsair has created an air tunnel of sorts, where relatively unimpeded air from the front intake fan washes over the drives and is then exhausted out of the chassis, isolated from the other heat generating components.

This cooling compartmentalisation becomes more and more apparent

as you spend time with the 250D. Not only is it designed so that drives and PSU are taken out of the air heating equation, but the generous grills on the side panel enables clean, isolated airflow to graphics cards (which, like the Prodigy, input air from the side and then exhaust it out the rear). All of this means that the air hitting the motherboard is largely unaffected by the major heat generating components in the case.

Also impressive is the approach taken by Corsair when it comes to CPU cooling choice. The overall design means that for most people a stock Intel cooler will be more than sufficient, but for those wanting to go fancy the 250D has the capacity to mount dual or single radiator closed loop coolers on the right hand side of the case, intaking or exhausting air through the grilled side panel.

This overall design has allowed Corsair to put a small window into the top panel of the case, which is about the only way to make the insides of the system visible. It is a small cosmetic nod, and thanks to the way in which

Also impressive is the approach taken by Corsair when it comes to CPU cooling choice.



the internal design of the 250D routes cabling away from the motherboard it isn't hard to make your system look slick and stylish.

Overall the 250D looks to be a smaller case than the Prodigy, but when one compares them it becomes clear that the 250D is marginally wider, but noticeably lower profile. This is mainly due to the 'handles' on the top and bottom of Bitfenix offering, which makes it stand taller, and we are still talking about two cases with the potential to deliver full sized ATX performance in a chassis a fraction of the size, so in our minds any difference is a very minor concern indeed.

The Obsidian 250D is the closest thing you'll find to Mini-ITX perfection. We still love the Prodigy and consider it a close second, but all the little touches that have gone into the 250D edge it ahead, and make for a product that we have a very, very hard time finding fault with. It is telling that the only real limitations of the 250D are those imposed by the Mini-ITX form factor, which is testament to Corsair's design team. The fact that such wonderful engineering features in a case that is set to be affordable as well (while we don't have a local price, it was announced at US\$89.99) is icing on the cake.

When we first heard whisper that Corsair was going to get into the Mini-ITX space we were cautiously optimistic – we've made no bones of the fact that we see Bitfenix and Corsair as the two most exciting companies in case design at the moment. What we didn't expect was for Corsair to hit it out of the park on its first attempt.

John Gillooly



PERFORMANCE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



PANASONIC LUMIX DMC-GM1

THIS SUPER SMALL SYSTEM CAMERA IS GREAT, BUT NOT FOR EVERY PHOTOGRAPHER

PRICE \$999
SUPPLIER www.panasonic.com/au



Panasonic's latest Lumix camera builds upon the success and versatility of the very likeable GX7, but packs those features into an even tinier package – arguably the smallest compact system camera you can get. It's very easy to like the GM1, but the contortions Panasonic had to go through to pack all that functionality has resulted in a few, well, not quite corners being cut, but you do miss some features.

With such a good lens included in the kit, and a superb micro four thirds sensor, you do feel the lack of a viewfinder. Battery life is not great, but the small form factor does have to power a lot of advanced features you won't find any other camera of this size; spare batteries are available, though they are a touch expensive. We'd

certainly suggest one or two if you're going to be frequently away from a charge while using the GM1.

But those niggles aside, the camera is quite remarkable. With the same Light Speed AF system as its larger cousin it's fast to focus, and great in low light conditions. The included 12-32mm lens is made just for the camera, and is very versatile.

Backed up by a range of truly useful presets, and a lot of SLR-grade tweaking if you're more serious about your shots, the GM1 simply doesn't feel like a small camera to use. The UI is easy to navigate, and the touch display is responsive and very handy. There's a single control wheel and a function key you can program, plus a control pad on the back, but the touch display does most of the heavy lifting for accessing and playing with camera features.

Also included is NFC and WiFi connectivity. We've used that in the larger GX7, and been impressed, but



found it a little more cantankerous in the GM1. It wouldn't connect to our home or office network, but the NFC functionality was flawless.

It's a great camera, especially for its size, but sits in an odd niche. It's nearly perfect for casual photographer looking for a bit of power and control, but it's a bit too well-featured as a backup if you're already using a DSLR. It's an easy camera to fall in love with regardless, and one that we're very happy to recommend.

David Hollingworth

IMAGE QUALITY	★★★★★
FEATURES&DESIGN	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

With APC Back-UPS, your digital life goes on... even when the power goes off.

Preserve what's most important to you.

Reliable power backup for 24/7 availability

Whether DVRing your favorite show, updating your Facebook status, or playing a live networked game, you depend on your home electronics every day, all day. That's why APC by Schneider Electric has designed battery backup solutions that protect the constant availability and connectivity you expect... and depend on.

Peace-of-mind protection on two levels

When the power goes out, our popular Back-UPS units go to work. They instantly switch your home technologies to emergency power, allowing you to work through brief power outages or safely shut down your systems so you won't lose valuable files—such as digital photos and media libraries. They also feature surge outlets to guard your electronics and data from "dirty" power and damaging power surges—even lightning. So you get two levels of protection in every APC Back-UPS unit!

Energy-saving insurance for what matters most

Our Back-UPS units protect your home office, digital living and home media applications, notebook computers, DVRs, and gaming application. And since we now offer energy-efficient models that reduce electricity costs through unique power-saving outlets, you can realise true energy savings regardless of the applications you're backing up. Throughout your home, the APC Back-UPS is the cost-saving insurance you need to stay up and running and reliably safeguarded from both unpredictable power and wasteful energy drains.



Keep your electronics up and
your energy use down!

ES Series

The ever-popular ES models are priced affordably yet provide enough extended runtime to allow you to work through short and medium power outages. Some power-saving models have been designed to actively reduce energy costs.

The energy-efficient ES 700G

The ES 700G boasts innovative power-saving outlets, which automatically shut off power to unused devices when your electronics are turned off or asleep, eliminating wasteful electricity drains.

- 8 Outlets • 405 Watts / 700 VA
- 68 Minutes Maximum Runtime**
- Telephone/Network Protection



The best-value ES 550G

The ES 550 uses an ultra-efficient design that consumes less power during normal operation than any other battery backup in its class, saving you money on your electricity bill.

- 8 Outlets • 330 Watts / 550 VA
- 51 minutes Maximum Runtime**
- Telephone/Network Protection



Power up to **WIN 1 of 3 APC**
ES700G Battery Back-UPS units!*
Visit www.apc.com/promo Key Code **53553K**

APC
by Schneider Electric

STEINBERG CUBASE 7.5

ELEGANT WORKFLOW REFINEMENTS AND IMPRESSIVE NEW PLUGINS – A SUPERB UPDATE

PRICE \$599; \$50 Upgrade
SUPPLIER www.steinberg.com

A lot of software follows yearly update cycles, but while this may be good for business, it isn't always enough time for developers to bring about significant changes. Cubase takes a different approach, with major updates every couple of years, interspersed with more modest point-five releases, which cost less.

Many of the new features are workflow improvements. You can now hide tracks in the project window, just as the MixConsole (introduced in version 7) can hide channels. They can be hidden and revealed individually; filtered by type such as Audio, MIDI or Groups; or filtered using more sophisticated criteria, such as showing only the tracks containing events between the locators. Large projects are often tricky to navigate, so this is a feature we can imagine coming to rely on.

We're big fans of Cubase's Lanes function, which makes it easy to record multiple takes and compile the best bits together. It's now joined by Track Versions. This feature also handles multiple takes but, unlike Lanes, shows only one take at a time. As such, it's better suited to trying out different ideas, rather than multiple performances of the same material. A Duplicate function makes it easy to create a backup before attempting complex editing. Management of Track Versions across multiple tracks is neatly implemented, although reading the manual is essential. It's also disappointing that Track Versions don't include automation data.

Cubase 7 offered two ways to use virtual instruments. An Instrument Track was the neater of the two, but only the more cumbersome VST Instruments panel supported multiple MIDI inputs and audio outputs. These two approaches have now been consolidated, with Instrument Tracks supporting multiple ins and outs, and the VST Instruments panel showing all virtual instruments used in the project.

Hitpoints – Steinberg's name for the markers automatically placed at the start of notes – are better managed.

Audio files are analysed for hitpoints as soon as they're recorded or imported, and there are keyboard commands to jump to the next or previous one. It's also now easier to tidy up detected hitpoints, prior to converting into a MIDI part or Groove Quantise template.

The buttons for configuring plugins have been redesigned. The look is cleaner, but that's partly because they appear only when the cursor is hovering nearby. As such, this step forwards for visual tidiness is a step backwards for discoverability. The ability to change plugin presets without launching the plugin editor is a useful time-saver, though.

PLUG AND PLAY

The update is rounded out with a collection of new and improved plugins. REVeLation is a reverb plugin based on synthetic algorithms – essentially a complex array of echoes. It includes subtle pitch modulation for the kinds of rich, syrupy reverbs that the existing REVerence plugin (which uses sampled impulses from real spaces, a technique known as convolution) can't match. It doesn't deliver the same delight that we get from the best Lexicon and TC Electronic reverbs, but it's good enough for critical use, and there's just the right amount of control to achieve great results quickly.

Magneto 2 is a tape-saturation plugin that adds harmonic distortion to give recordings extra warmth and vitality. It sounds more elegant and controllable than the existing tube- and tape-saturation effects. That's mostly thanks to the ability to filter out the top and bottom frequencies of the distorted component of the signal, which avoids muddying the mix at high saturation settings.

LoopMash FX is designed for live interaction, and performs a variety of DJ-inspired looping, stuttering and scratching effects. It works well triggered from a MIDI keyboard, and it's simple to use.

HALion Sonic SE 2 is the latest version of Cubase's sample-based virtual instrument, with everything from orchestral instruments to abstract bleeps among its 1520-strong preset library. This includes a set that doesn't use samples at all, using



▲ Track-visibility controls and better use of hitpoints make navigation easier

a three-oscillator virtual analogue synth and an arpeggiator to create complex rhythmic textures. Holding down a MIDI key produces a symphony of electronica.

Groove Agent One has been replaced by Groove Agent SE 4, and it's significantly more sophisticated. It's a sample-based drum machine with the ability to layer, stack and randomly alternate samples, and to modulate the pitch, filter and volume based on MIDI input velocity or curve-based envelopes. It can also slice up existing loops and send a MIDI file to the Arrange page to reconstruct or deconstruct it.

The only downside to the package is the annoying series of hoops we went through trying to find somewhere that sells it locally. Cubase 7.5 justifies its \$50 upgrade price; in fact, we'd pay \$50 for Groove Agent SE 4, Magneto 2 or REVeLation alone. More than ever, Cubase can produce professional-quality recordings without the help of third-party plugins. Meanwhile, its recording, editing and mixing facilities are as good as they come, with outstanding attention to detail. The dense, jargon-heavy interface makes few concessions to casual users, but this application doesn't shy away from giving demanding users the tools they need to work quickly, and to the highest standards.

Ben Pitt

EASE OF USE
FEATURES&DESIGN
VALUE FOR MONEY



OVERALL



APPS ROUND-UP

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

► INKREDIBLE

The iPad may not have built-in stylus support like a handful of Android and Windows tablets, but it has no shortage of great inking apps. INKredible (also available for Android) is the latest to join the fray, with smart palm rejection technology, vector graphic ink effects, and multiple pen tools for writing and drawing on the screen.

The beauty of INKredible is that it keeps things simple. Rather than flood the app with a whole bunch of extraneous features like handwriting recognition, shape detection or audio recording, the developer has made INKredible the digital equivalent of a piece of paper. You can switch between multiple pen tools (a fountain pen comes free, calligraphy, ballpoint and wet brush pens are available as 99c in-app purchases), use a 'close-up writing' mode to fit more writing into the limited on-screen space, and move text around, but apart from that, the app is refreshingly light on features, and this translates to its being a lot easier to use than most other inking apps.

One of the best things about using



PRICE FREE
DEVELOPER VIET TRAN **PLATFORM** IPAD, ANDROID

INKredible is how natural it makes your handwriting look. If anything, the default fountain pen tool actually makes your handwriting appear more aesthetically pleasing than it does when you use a ballpoint pen on a piece of paper. Testing it out on an iPad Air using our finger, it also felt remarkably natural to write with, as the text appeared immediately below our finger on the screen and there was no lag whatsoever.

Switching to a capacitive stylus, the smart palm rejection technology works just as advertised to prevent your hand from making a mark if you rest it on the screen while you're writing.

The irony of using INKredible is that it works so well, you end up wanting it to have more features like shape recognition, image insertion and multiple notebooks, and therein lies the brilliance of the developer's business model. By making INKredible free, it opens it up to a huge market of users that wouldn't otherwise pay for it. Once they get used to the app's superior inking capabilities, the developer can then up-sell them to the feature-rich Notes Plus app for \$10.49

EASE OF USE

FEATURES

VALUE FOR MONEY



OVERALL



► CHOICEMAP

Can't decide whether to ditch your boyfriend/girlfriend or simply what to eat for dinner? There's an app for that. ChoiceMap takes a scientific approach to decision-making by scoring all of your available options. Templates for the most common life choices are already included; otherwise, you can create a new 'choice' using a simple wizard.

Sadly, ChoiceMap won't do all of your decision-making for you. Instead, it helps you evaluate all of the options that you enter into the app manually. If your choice is one of the built-in templates (such as baby names, politicians, wedding venues and vacations), you'll get a handful of customised 'priorities' to rate that may have an impact on your decision.

In the 'Dinners to cook' choice, for example, the included priorities are health, prep time, ingredients on hand and taste. You can customise the priorities by adding or removing them from the list, and you rank them by how important they are to your decision. The final step is ranking how well each of the dinner options satisfies those



PRICE FREE
DEVELOPER CHOICEMAP **PLATFORM** IPHONE

priorities, and the app then uses an algorithm to allocate a percentage score to each option.

ChoiceMap doesn't work so well for simple yes/no decisions, but you can work around this by stipulating what the exact options are. If you can't decide whether to go on a date with someone, for instance, instead of making your options 'yes' and 'no', you make them 'go out with him/her', and 'stay friends'. Negative statements are also tricky, which is why we used the latter choice rather than 'don't go out with him/her'.

The only thing we'd like to see in the app – apart from a bit more eye candy – is suggested options for some of the template choices. Using the 'Dinners to cook' template again as an example, having a 'suggest options' button that added five popular dishes would be a handy addition to get the decision-making process rolling.

EASE OF USE

FEATURES

VALUE FOR MONEY



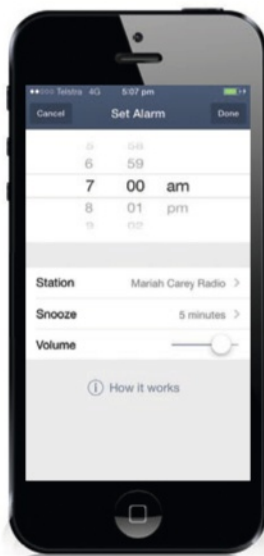
OVERALL



► PANDORA INTERNET MUSIC RADIO

PRICE : FREE
DEVELOPER PANDORA MEDIA
PLATFORM IPHONE, IPAD,

Pandora Internet Music Radio may be one of the grandfathers of online music streaming apps, but a recently introduced feature may change the way you use it. Debuting in the 5.1 release for both iOS and Android is a new alarm clock feature that lets you wake up (and fall asleep) to your favourite Pandora station. However iOS users don't have it anywhere near as good as their Android counterparts. While the latter users can set a daily recurring alarm and have the app automatically wake their smartphone to sound the alarm, iOS users have to set the alarm manually every time and leave their phone running with Pandora active on the screen overnight in order for the alarm to turn on.



OVERALL



► QUIT YOUR JOB

PRICE FREE
DEVELOPER JAKE LEVINE
PLATFORM IPHONE

Not everyone has the balls to do a Jerry Maguire-style exit when they leave the company. If you'd rather send your boss a scathing message once you've safely absconded from the office building, the Quit Your Job app is worth a look. The app takes you through a wizard that customises your exit letter based on your reasons for leaving. You can only send it via text message, but it's easy enough to copy and paste that text into an email. More problematic is the fact that the app doesn't take itself seriously enough, which prevents people from using it legitimately (some of the leaving reasons it offers are to join a circus and start a career writing fortune cookies). The final messages, while funny, are also a bit short on content and not nearly snarky enough for our liking.



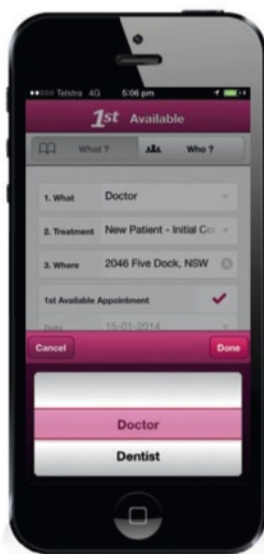
OVERALL



► 1STAVAILABLE

PRICE FREE
DEVELOPER 1STAVAILABLE
PLATFORM IPHONE, IPAD, ANDROID

Next time you need medical attention, you won't have to ring around to multiple surgeries and be placed on months-long waiting lists. 1stAvailable does all of the heavy lifting for you, searching through a database of more than 3200 Australian practitioners and looking for gaps in their calendars. It's easy enough to use, even if the interface is a little clunky. You simply plug in the type of medical practitioner you're after (doctor, dentist, dermatologist, etc) and the sort of treatment you need, and it can either find the first available appointment near your location or check for a specific date and time. Once you find a suitable medical professional, you can make a booking directly through the app; however, you can't cancel it through the app if you end up changing your mind.



OVERALL



► CONFIDE

PRICE FREE
DEVELOPER CONFIDE
PLATFORM IPHONE

Remember Inspector Gadget's self-destructing messages? Confide is the new-age version for iPhone users. Messages you send through the app are hidden behind orange blocks, and as soon as you reveal each line (done by swiping across the screen), the words disappear from the screen – a tactic that gets around Snapchat's screenshot vulnerability. In fact, if you try to take a screenshot, the app dumps you back to the main screen immediately and you can't access the message any longer. Confide uses end-to-end encryption and doesn't store any messages on its own servers, which is reassuring for business users and those who are up to no good. The only downside, really, is that you can only use it to send messages to other iPhone users.



OVERALL



LABS BRIEFS

▶ BITFENIX FLO

PRICE TBC

WEBSITE www.bitfenix.com.au

Better known for its work with cases, we were hopeful that Bitfenix would deliver an at least competent outing with its first foray into audio, and we've actually been rather pleasantly surprised. Erring on the side of bass is better, the Flo headset is definitely aimed at gaming, but with a removable boom mic, you'll happily use them on the road for music as well – especially as they look quite stylish. They're comfortable, too, and quite good at isolating sound even in a busy office. Complete with a good selection of cables for using at your desk or with your mobile, these versatile cans are currently priced at about \$US80, so should be pretty good locally. We'd have no issue recommending them.

David Hollingworth



OVERALL



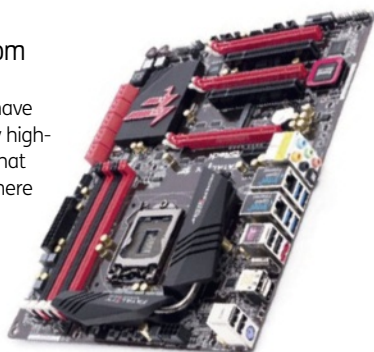
▶ ASROCK FATALITY Z87 KILLER

PRICE \$189

WEBSITE www.asrock.com

Gaming motherboards have evolved from incredibly high-end products to ones that deliver a better experience to mere mortals, bringing some of the important extras seen at the high end down to a reasonable price. The latest Z87-based gaming board from Asrock sports the company's Purity Sound chip, Asrock's special accelerated Fatal1ty mouse ports and a Killer E2200 GbE chip. It all makes for a well-rounded solution, as long as you don't want to run more than two GPUs (the third lane is 4x only). Bear in mind that this board only has the Killer networking chip, which could prove a problem for Pro gamers competing at LAN events. For everyone else this is a great all-round solution, lacking in the bells and whistles seen on some other brands of board, but at a very tempting price.

John Gillooly



OVERALL



▶ LENOVO YOGA TABLET 8

PRICE \$349

WEBSITE www.lenovo.com.au

The most important thing to remember with the Yoga Tablet is that it has little to do with the Ultrabook of the same name. Instead it is an 8in Android model, built around a folding hinge designed to act as an integrated stand. At first blush it looks like a great device, with a decent 1280 x 800 resolution IPS screen and Android 4.2.2.

While the concept is decent enough, the Yoga is let down by a sluggish Mediatek CPU and only 1GB of RAM. We also found the screen just wasn't up to par with some of the better tablets out there. Add in the fact that you can buy a better-equipped Nexus 7 for a touch less cash and we find it hard to recommend this tablet. It is useful if you plan to make full use of the integrated stand, but otherwise the Yoga Tablet 8 is just a touch too overpriced to stand out from what is becoming a very crowded part of the market.

John Gillooly



OVERALL



▶ CORSAIR HYDRO H105

PRICE \$180

WEBSITE WWW.corsair.com

Positioned at the high end of Corsair's closed-loop water cooler range, the H105 is designed to be the most effective of the company's dual radiator coolers. It does this by employing a different radiator to other models in the range, one that is a full 11mm thicker. This increased size means increased surface area on the fins, which in turn means theoretically increased cooling power.

This played out in our testing, where we saw temps a few degrees cooler than what we have previously seen with the H100i. Suffice to say that we have no qualms with its cooling ability, which is very much top of class. That said, this cooling power definitely doesn't come cheap, and you have to pay attention to your choice of case, thanks to the increased thickness of the radiator. It also lacks Corsair Link, which won't matter to many, but will have some sticking with the H100i. Yet another great closed-loop cooler from Corsair, but one for the high-end user who is fine with paying such a premium price.

John Gillooly



OVERALL



▶ STEELSERIES STRATUS

PRICE \$129

WEBSITE www.steelseries.com

There's a lot to like about SteelSeries' entry into the mobile gaming space. The Stratus may look like a dinky-toy, but it boasts SteelSeries' usual design flare, fitting full size controller functionality – including four shoulder buttons – into something not much larger than a pack of cards. It's very well made, and assuming your hands aren't too large, surprisingly comfy, with a clever cover that also doubles as an extra grip. About our only gripe, though, is that it's really only for ultra-up-to-date iOS users. If your iPhone or iPad can't handle iOS 7, you're plum out of luck. It's also a touch pricey, but we do feel you're getting a lot of quality. There are limited games that support the new breed of iOS game controllers at the moment, but with Apple making a big push to this and others supported by game makers, we expect that to change real soon.

David Hollingworth



OVERALL



▶ MICROSOFT WIRELESS MOBILE 3500 MOUSE

PRICE \$20

WEBSITE www.microsoft.com

Over recent months we have seen a lot of different mobile mice flow through the labs, mostly based around bluetooth connections. This mouse, on the other hand, is a little more old school, coming with a dedicated receiver and a very reasonable pricetag. Being a mobile-focused model, it is relatively tiny, but it feels okay in the hand, delivering satisfying, solid clicks and a good clicky scrollwheel action.

The mouse itself is based around Microsoft's Bluetrack technology, which still stands as one of the best engines out there for tracking on all kinds of surfaces. It means this mouse doesn't need a pad, and is ready to go wherever you may be. It comes in a variety of designs, with models suiting all kinds of tastes, and while we see Microsoft's textured patterns to be largely gimmicky, they don't actually detract from the experience of using the mouse in any way.

John Gillooly



OVERALL



Information Technology

Design your IT career in 2014

Direct entry now available

Choose from a range of undergraduate degrees, coursework masters, graduate diplomas and certificates across all areas of information technology.

Research programs, online credit recognition, Industry Based Learning, off-campus study and International Merit Scholarships are also available.

The courses offer students the opportunity to develop expertise in the following areas:

- Applications development
- Computer science
- Games development
- Multimedia development
- Librarianship and information science
- Project management
- Security
- Software engineering

it.monash.edu/2014



MONASH University

Australia ■ Malaysia ■ South Africa ■ Italy ■ India

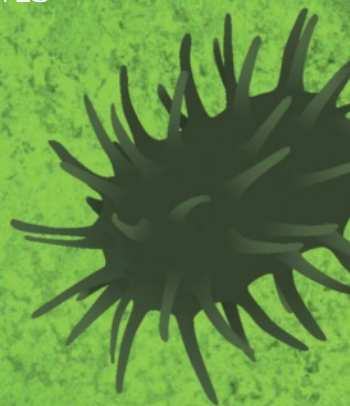
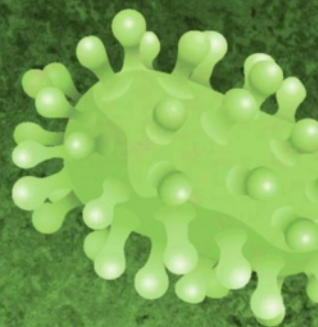


GROUP OF EIGHT

CRICOS Provider: Monash University 00008C

SWITCH YOUR ANTIVIRUS

IT'S IMPORTANT TO PROTECT YOUR PC AGAINST MALWARE, BUT ARE YOU USING THE RIGHT SOFTWARE? WINDOWS 8 HAS USHERED IN A NEW GENERATION OF LOW-POWER HARDWARE, SO PERFORMANCE IS MORE IMPORTANT THAN EVER – AND SMARTPHONES AND TABLETS NEED PROTECTION, TOO. WE FIND OUT WHICH SUITES ARE THE RIGHT FIT FOR TODAY'S DEVICES





CONTENTS

Buyer's guide	58
Feature table	58
How we test	70
Results	70
Antivirus for Android	62
View from the Labs	69

WINDOWS

Avast Free Antivirus 2014	60
Eset Smart Security 7	61
Kaspersky Internet Security 2014	64
Norton Internet Security	66
AVG AntiVirus Free 2014	67
Bitdefender Internet Security 2014	67
McAfee Internet Security 2014	68
Microsoft Windows Defender	68
Trend Micro Titanium Internet Security 2014	69

ANDROID

Norton Mobile Security	62
Eset Mobile Security & Antivirus	63
Qihoo 360 Mobile Security	63
Trend Micro Mobile Security & Antivirus	63

Buyer's guide

Security software is always evolving: it must, in order to keep up with the ever-changing nature of online threats.

The hardware doesn't stay still, either. Increasingly, we're using Windows on low-power laptops and hybrids, and carrying out our daily business on tablets and smartphones.

So, when it's time to renew your protection, it's a good idea to take stock and make a fresh assessment of your needs.



Perhaps the first question to consider is whether you want a basic antivirus package or a more comprehensive security suite. Most of the products in this month's Labs are offered in both forms, and either ought to protect you from dodgy downloads and network worms.

The difference between the two is that a suite will typically include extra features, such as a custom firewall, parental controls to keep kids away from dodgy websites, and browser extensions to prevent spies snooping on your banking and shopping sites. It's an option that may suit a family PC, where you can't be sure everyone will always act responsibly. It's possible to attain a similar level of protection by installing various free tools, or using features built into Windows, such as the Family Safety parental-control system, but it's convenient to have everything tied together in one package.

For a personal computer where this level of coverage isn't necessary, a simple antivirus package may be all you need.

Windows 8 comes with the Microsoft Windows Defender antivirus tool built in,

and users of earlier versions of Windows can download it (under the name Microsoft Security Essentials) via Windows Update. However, we've found that third-party offerings do a better job of neutralising malware, as this Labs will reveal.

Where Windows Defender excels is system performance. Necessarily, security software must scan applications and files as you access them, which inevitably slows things down. The extent of the slowdown, however, varies across packages. This is something to consider when you choose security software, especially if you're running on low-power hardware, where performance can vary noticeably.

Price is a factor, too, but commercial

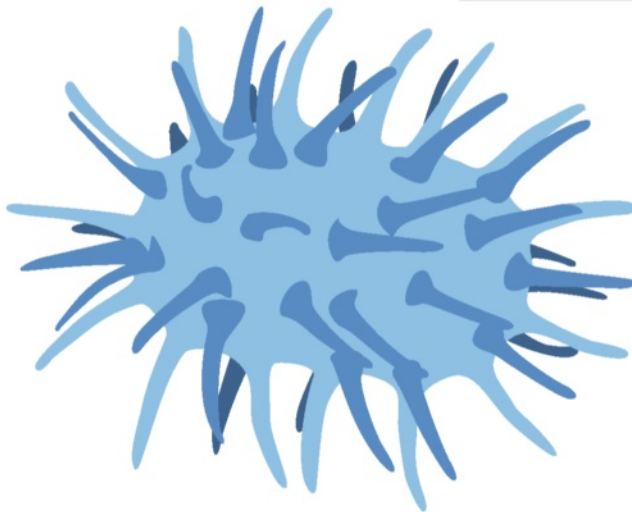
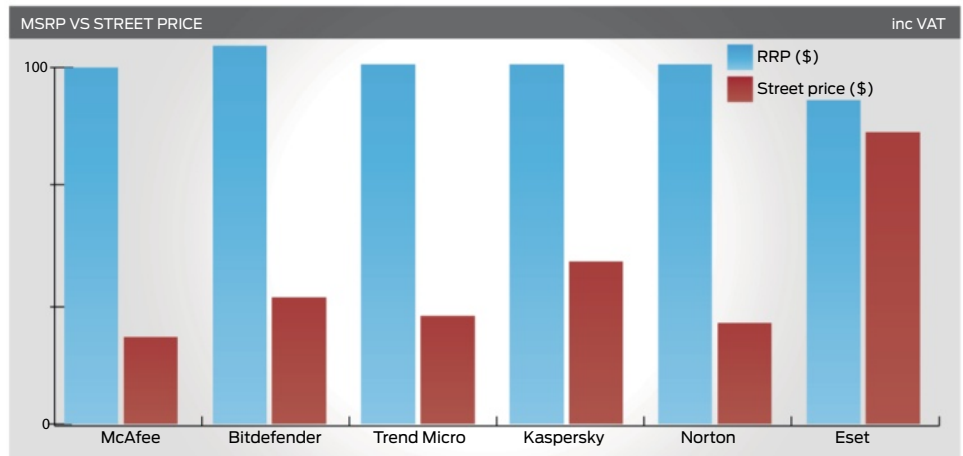


RECOMMENDED

	Avast Free Antivirus 2014	AVG AntiVirus Free 2014	Bitdefender Internet Security 2014	Eset Smart Security 7	
Overall	★★★★★	★★★★★	★★★★★	★★★★★	
Performance	★★★★★	★★★★★	★★★★★	★★★★★	
Features	★★★★★	★★★★★	★★★★★	★★★★★	
Ease of Use	★★★★★	★★★★★	★★★★★	★★★★★	
Value for Money	★★★★★	★★★★★	★★★★★	★★★★★	
Pricing					
Price	Free	Free	\$105	\$89.95	
Supplier	www.avast.com	www.avgfree.com.au	www.bitdefender.com.au	www.eset.com/au	
Free trial period	N/A	N/A	30 days	30 days	
OS support	Windows 8/7/Vista/XP	Windows 8/7/Vista/XP	Windows 8/7/Vista/XP	Windows 8/7/Vista/XP	
FEATURES					
Firewall	✗	✗	✓	✓	
Email scanning	✓	✓	✓	✓	
Web protection	✓	✓	✓	✓	
Anti-spam	✗	✗	✓	✓	
Online backup (standard)	✗	✗	✗	✗	
Parental controls	✗	✗	✓	✓	
Game mode	✓	✗	✓	✓	
App-style interface	✗	✗	✗	✗	
Other major features	Browser cleaner, rescue media creator, software updater	File encryption, secure delete	Facebook scanner, password manager, SafePay secure browser, secure delete	Anti-theft, social media scanner	
Technical support	Email, forum	Forum, IM, phone	Email, forum, IM, phone	Email, IM, phone	

security software needn't be expensive, especially if you shop around: independent retailers often sell subscriptions at much lower rates than you'll pay if you go straight to the publisher's website. Our graph to the right shows the MSRPs of the various paid-for packages in this month's Labs versus the best online prices we've found.

Choosing a free antivirus tool means you'll never have to deal with an expiring subscription, but you may have to put up with advertising as the developers push



you to upgrade to a paid-for package.

Some developers, such as Kaspersky (Kaspersky Pure) and Norton (Norton 360), offer premium packages that supplement the expected security features with online backup capabilities. These are good for peace of mind - you know your files will always be safe, even if your hard disk fails or your computer is stolen. Setting up a local backup can work out cheaper, though, and your online files will be available only for as long as you keep renewing your subscription - possibly at the

publisher's full rate, once your initial licence expires.

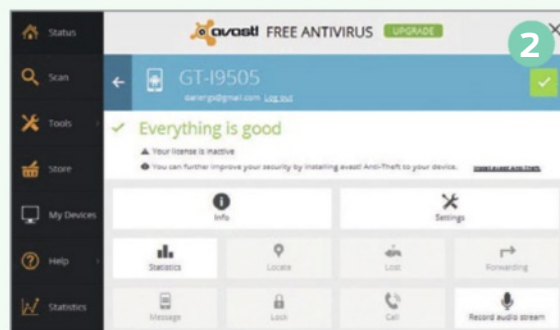
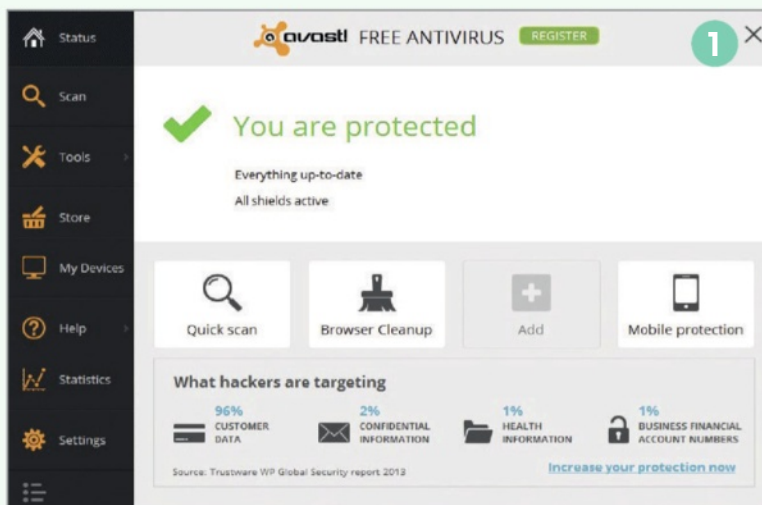
We're also starting to see multidevice licences. The prices we've cited this month cover three PCs for a year, but several publishers now offer packages that cover mobile phones and tablets. As we discuss on p62, mobile security software is mostly useful only for Android, and there are plenty of free security tools on that platform.

As we'll see, your best bet could be to use a paid-for security suite on your PC and a free scanner on your smartphone.

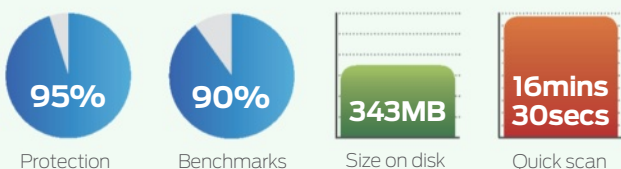


LABS WINNER

Kaspersky Internet Security 2014	McAfee Internet Security 2014	Microsoft Windows Defender	Norton Internet Security	Trend Micro Titanium Internet Security 2014
★★★★★★	★★★★☆☆	★★★★☆☆	★★★★★★	★★★★☆☆
★★★★★★	★★★★☆☆	★★★★☆☆	★★★★★★	★★★★☆☆
★★★★★★	★★★★★★	★★★★☆☆	★★★★★★	★★★★☆☆
★★★★★★	★★★★☆☆	★★★★★★	★★★★★★	★★★★★★
★★★★★★	★★★★☆☆	★★★★★★	★★★★★★	★★★★★★
\$99.95	\$99.95	Free	\$99.99	\$99.95
www.kaspersky.com	www.mcafee.com	www.microsoft.com.au	au.norton.com	www.trendmicro.com.au
30 days	30 days	N/A	30 days	30 days
Windows 8/7/Vista/XP	Windows 8/7/Vista/XP	Windows 8; Windows 7/Vista/XP (as Microsoft Security Essentials)	Windows 8/7/Vista/XP	Windows 8/7/Vista/XP
✓	✓	✗	✓	✗
✓	✓	✗	✓	✓
✓	✓	✗	✓	✓
✓	✓	✗	✓	✓
✗	1GB	✗	✗	✗
✓	✓	✗	✓	✓
✓	✓	✗	✓	✗
✗	✗	✗	✗	✗
Ad blockers, rescue media creator, Safe Money browser, virtual keyboard, vulnerability scan	Network management, secure delete, system clean-up, vulnerability scanner	None	Disk defragmenter, network monitor, password manager	Facebook scanner, personal data blocking, secure delete, system Tuner
Email, forum, phone	Email, IM, phone	Email, forum	Email, forum, IM, phone	Email, forum, phone



PERFORMANCE AT A GLANCE



AVAST FREE ANTIVIRUS 2014

THE CREAM OF THE FREE SECURITY SUITES, AVAST'S LIKEABLE OFFERING BRINGS EFFECTIVE VIRUS PROTECTION IN A LIGHTWEIGHT YET WELL-EQUIPPED PACKAGE

PRICE Free
SUPPLIER www.avast.com

Avast makes a good impression from the word go, with a clean, pane-based interface that neatly exposes all available features. Naturally, these include real-time and on-demand malware scanning, plus a web-protection module that runs as a local proxy (so it should work with whichever browser you use). The settings interface lets you change how and when pop-up notifications appear, set up and schedule scans, enter and exit the silent "gaming mode", and even configure email alerts, which will notify you from afar if anything untoward is discovered.

There's a decent selection of secondary features, too. The Browser Cleanup module removes nuisance browser add-ons and fixes configuration tweaks installed by spyware. The Software Updater tool keeps components such as Adobe Air, Flash and Java up to date, closing off vulnerabilities in the process. There's also a rescue-media builder that can create a bootable USB flash drive or CD in two clicks.

As is the norm with free security software, you'll find plenty of references to features that aren't included. Click on the firewall, sandbox or password-manager icons and you'll be invited to buy Avast's commercial suite. The Store offers further downloads, both free and paid-for. These extras are clearly signposted, except for the SecureLine VPN service, which is billed at \$10 per month. In fairness, you're offered a three-day trial when you activate the feature.

All of this stuff would be moot if Avast lacked a competent virus engine. However, in our tests, it proved the most capable of the free packages for the second year running, intercepting 94% of our real-world malware. The best of this month's paid-for suites did even better, but if you don't want to dig out your wallet, Avast comes fairly close to those levels of protection.

Avast also impressed with its ability to stay out of the way of legitimate software. With default settings, it all but matched Microsoft Windows Defender in our false-positives test, gaining a 99% rating (see p70). If you don't trust Avast's judgement, a new Hardened Mode feature takes the opposite approach, allowing only

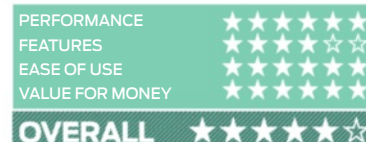
- 1 The main Avast interface is clear and attractive
- 2 Avast keeps an eye on mobile devices as well as your PC
- 3 The Software Updater keeps system components current

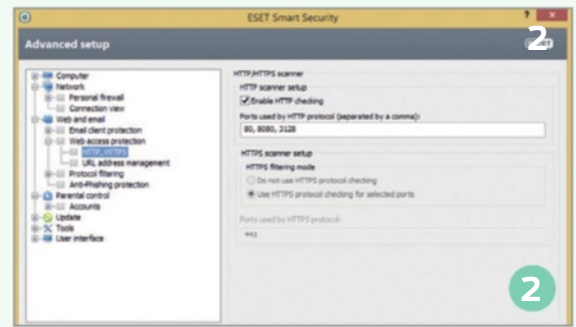
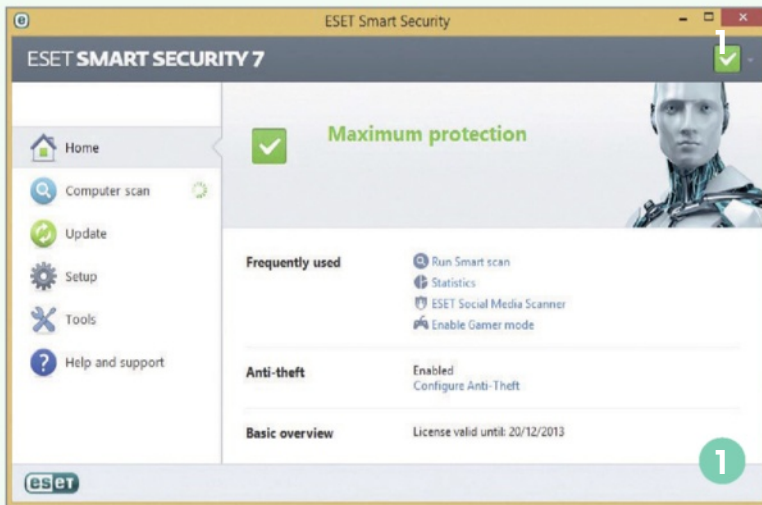


known, whitelisted executables to run. Not a bad idea for less technical users.

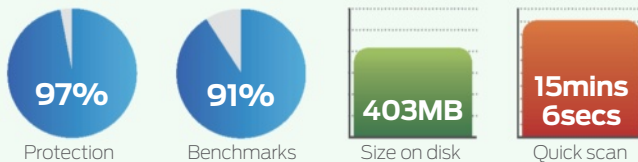
The last piece of the puzzle is system responsiveness, and Avast did well here, too. It felt smooth and slick, even on a low-powered Atom system. Not surprisingly, it wasn't able to match Microsoft's Windows Defender, and we weren't overjoyed about waiting more than 15 minutes for a "quick" system scan to complete. But with an overall performance score of 90% in our tests, Avast comfortably outpaced free rival AVG, and even beat most commercial options, arriving at a photo finish with Eset Smart Security 7. The 343MB disk overhead is easy to live with, too.

With so many boxes ticked, Avast is the obvious choice for those who want an annual subscription. There's even a free, complementary Android app; if you register at Avast's website, you can manage both subscriptions, and access anti-theft features for mobile devices and PCs.





PERFORMANCE AT A GLANCE



ESET SMART SECURITY 7

IF YOU'RE WILLING TO PAY THE PRICE, ESET PROVIDES A PREMIUM SECURITY SUITE WITH A CLEAR USER INTERFACE AND EXCELLENT PROTECTION CAPABILITIES

PRICE \$89.95
SUPPLIER www.eset.com

Next to the complexity of Kaspersky's front-end, Eset Smart Security 7 is a breath of fresh air. The interface is easy to read and navigate, with plenty of white space and a consistent set of controls spread across the six main tabs.

It helps that Smart Security 7 isn't quite as laden with bells and whistles as Kaspersky's offering, but that doesn't mean it's short on features. Click into the Advanced Setup view and you'll find pages of configuration options, including network and process activity monitors that aren't too dissimilar to Kaspersky's.

You'll also find some nice secondary features. Besides scanning modules for files, emails and web pages, Smart Security 7 includes Eset's SysInspector tool, which allows you to take a security snapshot of the state of your system. Processes, network connections and important Registry entries are recorded and heuristically assigned risk levels. If you make a snapshot while your computer is running smoothly, you can compare

it to later snapshots to see if anything concerning has changed.

Another headline feature is Eset's anti-theft service, which helps you track down your laptop if it's stolen. You can find it on a map, see what's going on onscreen, and even use its camera to observe who's using it. It's similar to the anti-theft capabilities of Eset's Android app (see p63), although the two aren't integrated. There's also Eset's Social Media Scanner, which blocks dangerous links on Facebook and Twitter, and can post automatic warnings to others to steer clear.

As a package, then, Eset Smart Security 7 takes a rounded approach to malware, and its overall protection score of 97% reflects a strong performance in our real-world tests – only Norton and Kaspersky did better. Meanwhile, safe applications generally ran without a peep: in our false-positives test, Eset scored comfortably above average, achieving a 96% rating.

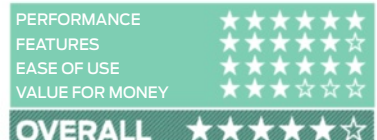
Smart Security had minimal impact on system responsiveness. Its 91% performance score versus Microsoft Windows Defender represents a rating of 95% in the Explorer test, and 86% in our application benchmark: that's ahead of any other third-party

- 1 The Eset Smart Security interface is beautifully clear
- 2 Advanced settings are there for those who want them
- 3 Eset had almost no impact on system responsiveness

software here. If you aren't happy with the protection provided by Microsoft's built-in system, this is as good as you're going to get. Eset's 403MB disk footprint is more space-efficient than any of its commercial rivals, too.

All that stands between Eset and an award this month is the price. Unlike most of its rivals, Eset doesn't offer big discounts through retailers, so a three-PC licence will cost almost the same as buying direct. That's hard to swallow when you realise the SysInspector and Social Media Scanner – two distinctive features – are offered as free, standalone downloads. Eset's anti-theft service isn't free, but it can be largely replicated by free services such as Prey (<http://preyproject.com>).

As such, we can give Eset Smart Security 7 only a qualified recommendation. If a few bucks here or there doesn't matter to you, by all means buy in: it's a superbly effective and low-impact security suite with convenient built-in extras.



Antivirus for Android

It's generally accepted that if you're running Windows, antivirus software is a must. It's fair to say that this consensus hasn't spread to mobile devices, but you shouldn't be complacent about mobile scams and malware.

Not all devices are equally at risk. Of the major mobile operating systems, Apple's is the safest, since it allows applications to be installed only from the manufacturer's carefully vetted online store. This makes it extremely difficult for dangerous software to sneak onto your iPhone or iPad. Both iOS and Windows Phone insist on running third-party apps in a virtual sandbox, too, which limits their ability to cause trouble or tamper with your system settings.

By contrast, Android gives apps a greater degree of access to the operating system; this is what makes it possible to install third-party keyboards and replacement SMS apps, which Apple and Microsoft don't allow. Google also lets users install applications from any source they choose, and doesn't actively screen apps that are made available through Google Play.

So it's no surprise that Android is the main breeding ground for mobile malware. A recent white paper by security specialist F-Secure reported

that 97% of the mobile malware discovered in the third quarter of 2013 had targeted Android. A typical example of such malware would be an innocent-looking app that quietly sends text messages to premium-rate SMS services, running up large profits for the operators at the user's expense.

Don't panic, though. If viruses can run, so can antivirus. Recent versions of Google Play include a scanner that checks freshly installed apps for threats, and there are dozens of third-party security apps – both free and paid-for – that provide secondary features such as parental controls and custom anti-theft measures.

Independent security specialist AV-Test (www.av-test.org) recently tested 28 Android security apps to see which ones did the best job of identifying rogue apps. The full results are available at <http://tinyurl.com/mqmw9lv>. If you're running a package that didn't fare well, it may be time to switch; if you're not running any mobile security software at all, it's definitely time to get protection. On these pages, we review four high-quality options for Android, looking at their usability, feature set and value for money.

To be clear, we're not saying iOS and Windows Phone users can forget about



malware entirely: attacks so far have been rare, but it's always possible that some ingenious hacker will find a way to subvert the system. If and when that happens, however, it's unlikely that a security app will be able to protect you anyway, thanks to the sandboxing principle that prevents applications from interfering with one another. As a result, most "security" apps marketed for these platforms have limited functionality; you may as well save your money.

NORTON MOBILE SECURITY

The free edition of Norton Mobile Security automatically scans new applications as they're installed, and can also scan your whole device daily, weekly or monthly. You can choose how frequently definition updates should be automatically downloaded, and specify that they should be downloaded only over Wi-Fi.

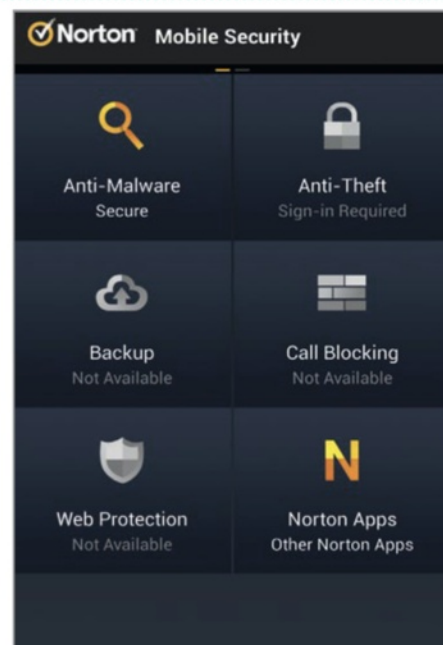
AV-Test found that Norton detected an excellent 99.6% of malicious apps, and didn't perceptibly slow down the device or drain the battery – although the testers did observe an elevated level of internet traffic.

Norton's interface is clear enough, but if you're using the free edition, most buttons are disabled. To activate the Anti-Theft, Backup, Call Blocking and Web Protection features, you need a licence, which costs \$130 for the Norton 360 multidevice package (see p66), or \$30 per year for a standalone mobile subscription.

These added tools – including the ability to remotely make your phone draw attention to itself by "screaming" – are good features, but there are plenty of alternative backup and anti-theft tools available more cheaply. Also, it's questionable how necessary a web protection module is – yes, it will steer you away from phishing sites, but "drive-by downloads" are mercifully unknown on Android.

You can't argue with Norton's effectiveness, but Android phones and tablets tend to appeal to more cost-sensitive users – we suspect the price will prove a deal-breaker for many potential customers.

PERFORMANCE	★★★★★
FEATURES	★★★★★
EASE OF USE	★★★★★
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★★



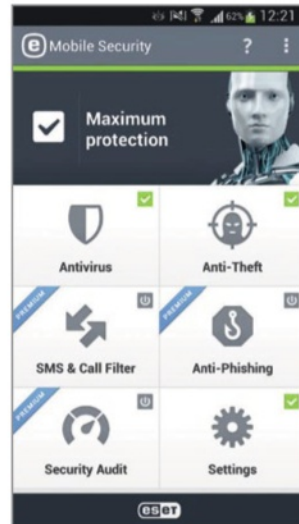
ESET MOBILE SECURITY & ANTIVIRUS

Like Norton, Eset Mobile Security & Antivirus is a free app with premium features that can be unlocked by buying a licence. The free features include basic anti-theft controls, such as a remote siren that helps you find your phone if it's nearby. Disappointingly, you don't get scheduled scans, nor automatic updates: you have to manually update the database.

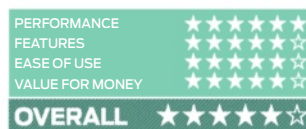
The good news is that Eset's subscription rate – \$14 per year – is much cheaper than Norton's. This unlocks an anti-phishing filter, plus tools that block messages and calls based on the time or custom groups, while remaining available to family and friends.

There's also a Security Audit feature, which checks for issues such as insecure system settings or low disk space. It can also keep track of which apps on your device have which permissions.

When it comes to protection from malicious software, AV-Test found Eset's software marginally behind Norton's, at 99.4%. There was no significant increase in network traffic, though,



and battery life and performance were unaffected. Although the limitations of the free offering feel a little mean, the paid-for package is affordable and pleasant to use.



QIHOO 360 MOBILE SECURITY

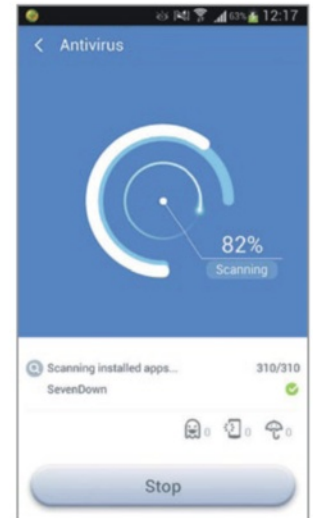


First place in AV-Test's malware review went to a name you might never have heard of – Chinese security specialist Qihoo, whose 360 Mobile Security app saw off an exceptional 99.9% of mobile malware. It sailed through usability tests, too, having no troublesome impact on performance or battery life.

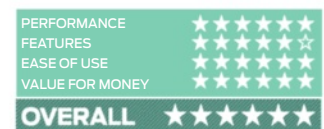
Qihoo includes a vulnerability scanner that can detect possible avenues of attack and block them before they're exploited: on our test phone, we were warned that a handset-specific app could be abused to create fraudulent SMS messages.

There's a privacy advisor, too, which generates a list of apps with potentially dangerous abilities, such as making calls or tracking your location. A call-blocking feature lets you blacklist numbers, and the system-cleanup tool wipes caches and optionally closes running apps.

The best part is that all these features are free, and Qihoo doesn't nag you to upgrade, or try to lure you with the promise of premium features: it's great



for anyone who doesn't need extra capabilities such as parental controls or backup. If you're not already running security software on your phone, give Qihoo 360 a whirl.



TREND MICRO MOBILE SECURITY & ANTIVIRUS

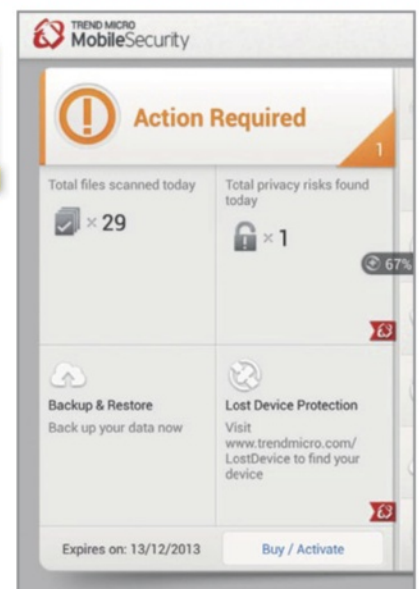
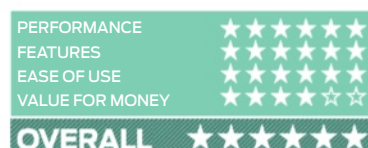
Trend Micro's mobile security suite has a pleasingly clean interface, and you get a 30-day trial of its premium features. Subscribing costs \$30 per year, and bags you anti-theft tools, configurable call and message blocking and Trend Micro's Data Theft Scanner, which analyses the permissions of your apps to identify the ones that could steal your private information.

You also get a SafeSurfing module, which warns you away from dangerous websites, and a parental-controls tool that blocks access to content according to your specified age range – ideal if you share a device with your kids.

If you choose not to pay, you still get decent malware protection. AV-Test gave Mobile Security & Antivirus a 99.5% score in its malware tests, and found that the software didn't have a major impact on battery life,

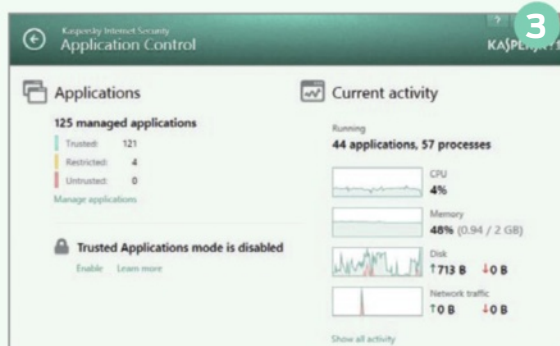
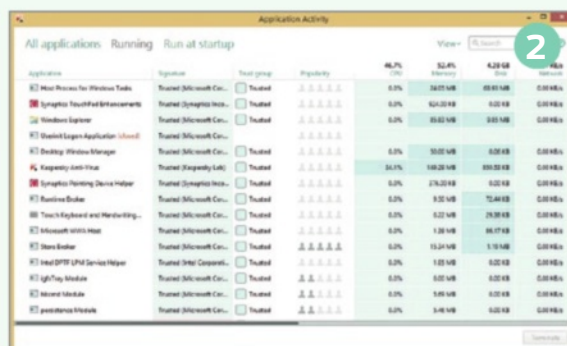
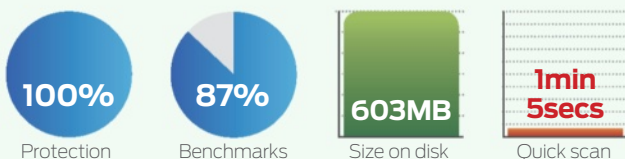
network traffic or device performance. The malware database updates automatically, to a daily, weekly or monthly schedule.

The buttons labelled Backup and Scan Facebook link to external apps. The free Facebook scanner checks your privacy settings and warns you if you might be over-sharing. The automatic online backup agent is also free, but comes with only 50MB of space; it costs a small per year to upgrade to a more useful size. You may find Dropbox and Google Drive do a good enough job for less.





PERFORMANCE AT A GLANCE



KASPERSKY INTERNET SECURITY 2014

PACKED WITH ADVANCED FEATURES AND CONFIGURATION OPTIONS, KASPERSKY DELIVERED GREAT RESULTS IN OUR MALWARE-PROTECTION TESTS WITHOUT WRECKING SYSTEM PERFORMANCE

PRICE \$99.95

SUPPLIER www.kaspersky.com/au

Initially, Kaspersky Internet Security 2014 looks like a straightforward package; if you want, it can be. In our tests, the default installation intercepted 100% of threats without us needing to lift a finger. It barely raised a whisper about legitimate software, either: it's one of this month's least intrusive suites, losing out in our tests by only the tiniest margin to Avast and Microsoft Windows Defender. If you want a security suite that you can install then forget about, Kaspersky is an excellent choice.

However, there's plenty on offer for the more technically inclined. Dig into the interface and you'll find a wealth of clever and configurable security features. These include a firewall and a web scanner, plus a safe browser for financial transactions, which it implements by sandboxing Internet Explorer within a green border.

Elsewhere in the package, you'll find a virtual keyboard for evading keyloggers; a vulnerability scanner that analyses your system and applications for known weaknesses; and even

a simple ad-blocker (malware has been known to propagate via online advertising systems). There are also tools for monitoring network and application activity, and if you want to lock down your computer as securely as possible, you can switch to Trusted Applications mode, in which only whitelisted programs can run. Pretty much the only thing you don't get is online backup: for this, you'll need the pricier Kaspersky Pure package.

If all this sounds overwhelming, it can be. As we mentioned, the software looks straightforward at first glance, but once you start exploring Kaspersky's features and options, you can easily get lost as the interface's various overlays and secondary windows slide and switch into place. It's a shame, because the individual interface pages are clear and accessible in isolation, offering plenty of information and configuration options – once you find the view you're looking for.

While the interface feels unwieldy, the back-end isn't too cumbersome. Kaspersky's performance in our Explorer benchmark was hardly exemplary: it was saved only by the dire performance of McAfee.

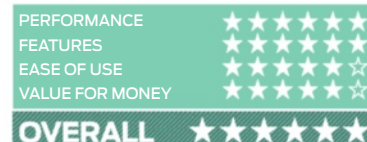
- 1 The main Kaspersky interface looks deceptively simple
- 2 System tools help experts monitor security themselves
- 3 Application Control keeps an eye on what's running



However, when it came to opening applications, Internet Security 2014 put in a much stronger performance, placing second after Windows Defender to record a decent score of 87%. Similarly, Kaspersky's 603MB disk footprint is on the large side, but not extravagant enough to represent a serious black mark.

If you buy Kaspersky Internet Security 2014 through the developer's own website, you'll pay \$100 for a three-PC, one-year licence; with a little shopping around, we found the same package for a very reasonable \$49.

Kaspersky also offers multidevice licence bundles, so you can combine protection for Android devices and PCs. The software runs on iOS as well, but it has limited features on that platform. For PC-based protection, though, Kaspersky Internet Security 2014 is a terrifically effective security suite that we recommend for all but the most humble hardware.



USE NEW TECH!

To read about new science and tech!



That's right, the **Australian Popular Science app** is out now!
Plus, you can check out our other great science title **Australian Science Illustrated**.

WHY GO APP?

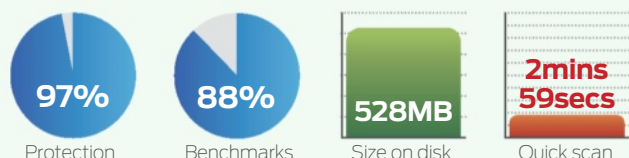
- ➔ **Save time!** Receive alerts when the next issue is out!
- ➔ **Save money!** Subscribe for even greater savings!
- ➔ Use your expensive tablet for **something more enriching** than tweets and recipes!

AVAILABLE NOW ON APPLE NEWSSTAND.

➔ Load the Newsstand store and search for **POPULAR SCIENCE** and **SCIENCE ILLUSTRATED**



PERFORMANCE AT A GLANCE



NORTON INTERNET SECURITY

NOT QUITE THE LIGHTEST NOR THE MOST POWERFUL SUITE ON TEST, BUT A SOLID PERFORMER ACROSS OUR REAL-WORLD DETECTION AND PERFORMANCE TESTS

PRICE \$99.99

SUPPLIER www.au.norton.com

Norton Internet Security is packed with custom technologies, bearing airy names such as Insight, Sonar and Pulse. To us these sound like deodorants, but they must be persuasive to some people.

These modules all contribute to the basic job of scanning files, websites and emails for viruses and scams. Insight draws on other users to work out whether an unrecognised file is likely to be dodgy; Sonar covers behavioural analysis, enabling the software to shut down threats that haven't been seen before; and Pulse downloads updates every 15 minutes or so, to protect you from new threats as quickly as possible.

It certainly stops viruses: in our real-world malware test, Norton intercepted 98% of our threats – more than any rival save for clean-sweeper Kaspersky. With default settings, though, it proved one of this month's more talkative packages: while less intrusive than McAfee and Trend Micro, Norton generated enough unnecessary

alerts to drag its overall protection rating down to 97%. Those who don't want to be bothered can engage Silent Mode, which suppresses all alerts.

The package includes a few other features, including Norton's performance monitor. There's also a network-security map and, unexpectedly, an idle disk defragmenter.

Along the bottom of the interface, you'll spy a series of links to numerous Norton-branded services, such as mobile protection and online backup, but most of these aren't part of the installed package. Some can be downloaded and used for free, while others require a separate subscription.

Online backup is built into the paid-for Norton 360 suite: it comes with 25GB of storage, and can be found online for a modest price premium. Norton 360 customers get the option of a multidevice subscription, which includes the Windows suite and the Android app (see p62).

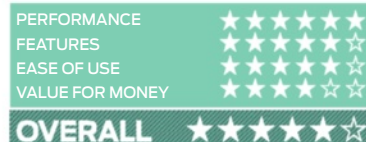
Like Kaspersky, Norton Internet Security offers an extensive configuration interface. We find this slightly less confusing than its Russian counterpart, but there's still a whiff of the rabbit warren about it, with sub-

- 1 Major functions are controlled by switches and panels
- 2 Dig deeper and you'll find plenty of customisation options
- 3 Norton also keeps track of performance and events

panes and overlays appearing all over the place as you click around.

Norton's impact on the performance of our test system wasn't too burdensome. Versus Windows Defender, it scored 91% in our Explorer test and 86% in our applications benchmark, ahead of the group average. In terms of disk space, the default installation weighed in at 528MB, also the right side of average.

In short, Norton Internet Security offers decent protection without bogging down your system unreasonably. It isn't as laden with features as it first appears, however, and it didn't take first place in any of our tests. At current online prices, it's also one of this month's more expensive suites. For these reasons, it doesn't receive a wholehearted recommendation this time, but if you see Norton Internet Security on special offer, it's a perfectly competent choice.



AVG ANTIVIRUS FREE 2014

A FREE VIRUS SCANNER WITH MORE ADVERTS THAN USEFUL FEATURES, BUT ITS MALWARE PROTECTION IS RESPECTABLE

PRICE Free
SUPPLIER www.avgfree.com.au

AVG's interface is clearly inspired by Windows 8, although it runs on the desktop. The big advert hanging off the bottom of the main window serves as a pointed reminder that this is a free product – and once you start clicking around, you discover many tiles merely open up further adverts for AVG's paid-for products.

The range of features actually present and functional is pretty basic, albeit broader than that offered by Microsoft Windows Defender. In a nutshell, you get on-access malware scanning for files and local emails, plus AVG's Surf-Shield, which looks out

for malicious web pages and phishing sites. This uses packet analysis rather than a plugin model, so it should work with any browser.

You also get AVG's Data Safe encryption tool, plus a "shredder" for permanently deleting sensitive files, but there are plenty of freeware utilities capable of doing the same.

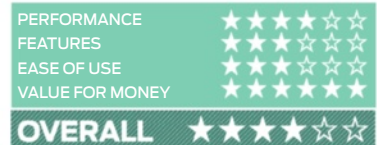
For a free scanner, AVG's effectiveness isn't bad: in our malware tests, it protected us against 93% of threats. That's a whisker behind Avast, but a solid 11% ahead of Microsoft's offering. AVG also kept suitably quiet during our false-positive test, gaining a score of 98% – although, again, Avast managed to nose ahead.

AVG fell further behind in our responsiveness tests: in our applications benchmark, it scored a sluggish 80% compared to Windows Defender. At 333MB, the package is one of the lightest here, although there's a negligible difference of 10MB



between AVG and Avast's much more agreeable free offering.

Let's be fair: this edition of AVG AntiVirus costs nothing, it offers more features than Windows Defender, and it does a better job of intercepting malware; we can't complain about any of that. Navigating its advertising-strewn interface leaves a sour taste in the mouth, however, at least until you learn what's what. There's no need to go through this when Avast is more pleasant to use and more effective.



BITDEFENDER INTERNET SECURITY 2014

A WEIRD AND WEIGHTY PACKAGE WITH PLENTY OF FEATURES AND DECENT MALWARE PROTECTION

PRICE \$105
SUPPLIER www.bitdefender.com.au

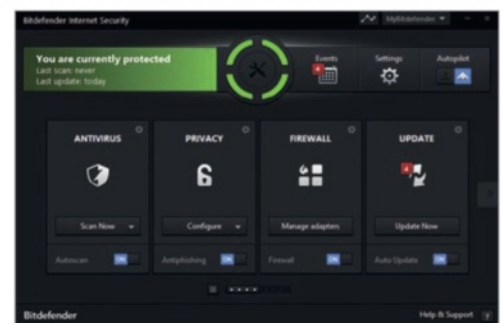
We've recommended Bitdefender Internet Security in the past, and this month it intercepted a creditable 97% of our real-world threats. Unfortunately, it also threw up several warnings about programs we knew to be safe, knocking its overall protection score down to 94%. You have a choice about this, though: click to activate Autopilot mode and Bitdefender will silently take whatever action it considers appropriate on your behalf. It's a nice touch for less technical users.

As well as the expected antivirus and firewall capabilities, Bitdefender offers a password manager, parental

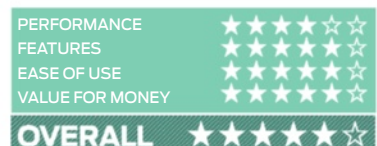
controls and a Facebook scanner. You also get Safepay, a simple, custom web browser intended for financial transactions that runs on its own secure desktop. Kaspersky's approach is a little less obtrusive, however.

Bitdefender's gloomy front-end doesn't expose everything that's on offer – in the default view, four key functions are weirdly hidden off the side of the window.

In our Explorer benchmark, Bitdefender scored a reasonable 92%; in the applications test, it managed a rather less dignified 82%. The effect wasn't too obtrusive, however, as CPU load didn't top 60% during scanning, and activity never ground to a halt. Perhaps a bigger concern is Bitdefender's use of disk space: after we'd installed the software, downloaded the latest updates and carried out a system scan, we found a huge 1.4GB of storage had been consumed, more than twice as much as any other package.



All of this makes Bitdefender's security suite an iffy choice for a tablet or an Atom-based laptop – for a system such as this, you might prefer a more light-footed package, such as Eset Smart Security 7. However, since Bitdefender Internet Security 2014 can be found online at a more competitive price, it remains a good choice for more powerful hardware where disk space and speed are less of an issue.



McAfee Internet Security 2014

POOR DETECTION RESULTS AND GLACIAL PERFORMANCE MAKE THIS SUITE ONE TO AVOID

PRICE \$99.95
SUPPLIER www.mcafee.com

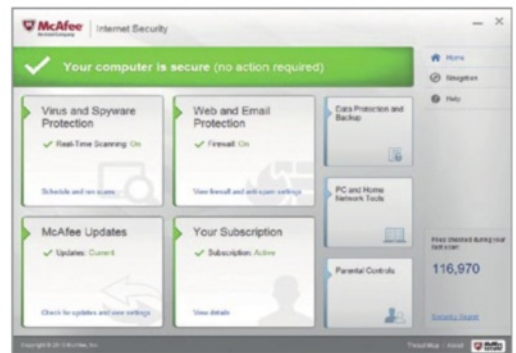
McAfee gives its partners leeway on price – we found a year-long, three-PC OEM licence online for only \$15. For that price, the features are impressive. Dig around and you'll find a firewall, an email scanner and a web protection module, plus parental controls and 1GB of online backup. Secondary tools include a secure-file deletion tool, a system cleanup utility and a vulnerability scanner. Considering this, the default installation of 470MB is pleasingly compact.

Unfortunately, McAfee makes a poor fist of its core job. In our malware tests,

it put in a bottom-place performance, protecting us against only 81% of real-world threats. It also came last in our false-positives test: as its 78% score indicates, McAfee regularly threw up unnecessary warnings and demanded our involvement when launching harmless software. Set-and-forget security this certainly isn't.

McAfee Internet Security 2014 also proved a disappointment in terms of system responsiveness. Our Atom-based system slowed to a crawl: in the Explorer test, we saw performance fall to 74% versus Microsoft Windows Defender, while our applications test produced an ignominious 64% result. Even the McAfee software itself felt sluggish and unresponsive.

The final indignity is CPU usage. Launching a quick scan caused the CPU load to shoot up to 100% for several seconds, before dropping to around 35%. Thankfully, it waits until your PC is idle to launch background scans.



Parts of the package are good. It's the only one here with online backup; the firewall is easy to configure; and – as we saw in a past Labs – McAfee's parental controls do a decent job of blocking porn, gore and gambling sites. However, in the critical areas, McAfee Internet Security 2014 is a letdown.

PERFORMANCE	★ ★ ★ ★ ★ ★ ★ ★
FEATURES	★ ★ ★ ★ ★ ★ ★ ★
EASE OF USE	★ ★ ★ ★ ★ ★ ★ ★
VALUE FOR MONEY	★ ★ ★ ★ ★ ★ ★ ★
OVERALL	★ ★ ★ ★ ★ ★ ★ ★

	PROTECTION	80%
	BENCHMARKS	69%

MICROSOFT WINDOWS DEFENDER

AN EXCEPTIONALLY LIGHTWEIGHT PACKAGE THAT PROVIDES ONLY A BASIC LEVEL OF PROTECTION

PRICE Free
SUPPLIER www.microsoft.com

Windows Defender – the latest version of Microsoft Security Essentials – is built into Windows 8. It's therefore our benchmark for system responsiveness, and, it must be said, it sets a high bar.

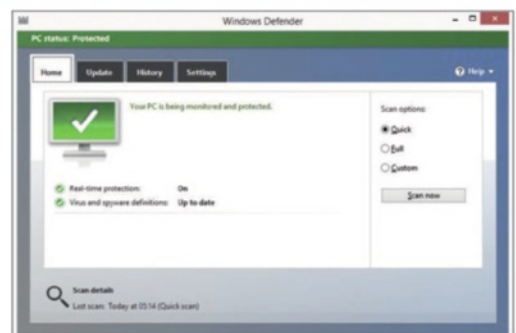
In our real-world tests, no other package this month – free or paid-for – was able to match Defender's lightness of touch. Compared to the group average, our Atom-based system running Defender proved more than 10% faster at opening Explorer windows, and more than 20% ahead of the pack when opening applications.

This nimble performance is doubtless assisted by the fact that – as

the Security Essentials brand implies – the package itself sticks to one simple job, namely scanning files and applications for malware. Other types of threat are addressed by other parts of Microsoft's ecosystem: the OS has its own built-in firewall, while Internet Explorer offers SmartScreen and Protection Mode to intercept unwanted scripts and downloads. Recent versions of Windows also offer cloud storage in the form of SkyDrive integration.

It adds up to a respectably balanced offering, and it's unobtrusive; in our tests, it almost never bothered us with unnecessary interruptions or misguided warnings about legitimate software, again serving as a yardstick for the rest of the group. Since it's already built into Windows, you don't have to give up extra disk space to use it, as you do with third-party options.

All of this makes Defender tempting if your prime concern is that a security suite should stay out of the way and not bog down your system.



Sadly, there's a big catch: Microsoft's malware-detection routines are far from the best in the business. In our tests, it intercepted only 82% of the threats we threw at it, placing it behind every competitor save McAfee. Although there are things to like about Defender, it's hard to recommend it when it makes such a lacklustre job of its core function.

PERFORMANCE	★ ★ ★ ★ ★ ★ ★ ★
FEATURES	★ ★ ★ ★ ★ ★ ★ ★
EASE OF USE	★ ★ ★ ★ ★ ★ ★ ★
VALUE FOR MONEY	★ ★ ★ ★ ★ ★ ★ ★
OVERALL	★ ★ ★ ★ ★ ★ ★ ★

	PROTECTION	94%
	BENCHMARKS	87%

TREND MICRO TITANIUM INTERNET SECURITY 2014

IT STOPS VIRUSES, BUT IT ISN'T QUIET OR LIGHT-FOOTED ENOUGH TO EARN A RECOMMENDATION

PRICE \$99.95
SUPPLIER www.trendmicro.com.au

Trend Micro came out swinging in our tests, with a creditable 96% malware-protection score. In the false-positives test, however, we saw a discouraging number of warnings when launching harmless software. Indeed, Trend Micro's score in this test placed it only 1% ahead of this month's wooden-spoon recipient, McAfee. Also, unlike some rivals, it offers no easy way to indicate that you'd prefer not to be bothered.

System responsiveness wasn't a strength, either. Trend Micro's software slowed down our Explorer benchmark to 89% compared to Windows

Defender, and bogged down our application benchmark to a laborious 69%. As in the false-positives test, it was saved from last place only by McAfee's poorer performance.

It's a shame, because we've happily recommended Trend Micro's security suite in the past. It's one of the more usable suites out there, with a clear and friendly interface. Even marketing links to other commercial products are clearly labelled and unobtrusive.

What you do get is well chosen. We especially like the ability to automatically intercept the transmission of certain sequences of characters, such as credit-card numbers. And, rather than reinventing the wheel, Trend Micro sensibly leaves the Windows Firewall in place and supplements it with a "Firewall Booster" that blocks additional vulnerabilities. On our test system, the installation fitted into 521MB of disk space, which isn't bad for a complete



suite. At this price, it has the trappings of a real contender.

Its false-positives score and low ranking in our responsiveness tests mean that, while Trend remains a good option if you are running a Core CPU, those with less grunt will want to look at lighter treading solutions.

PERFORMANCE	★★★★★
FEATURES	★★★★★
EASE OF USE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

	PROTECTION	92%
	BENCHMARKS	79%

VIEW FROM THE LABS

It's an age-old grumble: "Security software slows down my PC." In recent years, however, that chorus has died down. Developers have listened to feedback and worked hard to respond. It's a long time since we've had to deal with widespread reports of a package causing users' PCs to grind to a halt.

That said, we're yet to reach the point where performance is a non-issue. There was a huge performance gap – 31% – between the best and the worst on test this month.

Before we set out to sack the headquarters of our nearest security developer, it's vital to put that in context. As we explain on p70, the scale of that gap reflects the hardware as much as the software. If we'd carried out tests on a modern Core i5 system with a fast SSD, the difference would have been far less pronounced – to the extent that it would have been barely noticeable in everyday use.

That's why we chose the much less capable HP Envy x2 as our test system. We don't mean to suggest it's representative

of the mainstream market: these days, it's rare for a Windows PC based on a lightweight Atom CPU to pass through our labs. The model we used isn't even a particularly distinguished example of its breed, performing around the middle of the pack for a product of its type.

But this type of lightweight hardware is in the ascendant. For the past few years, the low-power end of the market has been dominated by iPads and Android tablets, but with the release of Windows 8.1, Microsoft's

"The gap between best and worst performer was huge"

vision of Windows on tablets is finally starting to catch on. Crucially, it isn't the ARM-based Windows RT that's leading the charge; it's low-cost devices based on Intel's Atom processors that are capable of running full Windows on a tempting budget, while still delivering the battery life expected from the tablet format.

Devices such as these need real security software – viruses don't know or care whether they're running on a tablet or a workstation. But it's important to remember that behind the slick Windows 8.1 front-end, there's only a modest provision of processing power, even in Intel's latest Bay Trail models. The last thing you want is a badly written virus scanner dragging down performance from this already low starting point.

By testing on the Envy x2, we're able to establish the worst-case scenario for anyone using a Windows 8 tablet or convertible, and therefore expose a clear hierarchy. If you're using more powerful hardware, you can afford to compromise here – hence our choice of Kaspersky Internet Security 2014 as the overall winner, despite it coming some way down the table in our benchmark tests.

But no matter what hardware you're using, the results of this month's Labs should help you choose a package that offers the right balance of protection and performance.

HOW WE TEST

We award star ratings to each package for Performance, Features, Ease of Use and Value for Money, as well as an Overall score.

The Performance score partly reflects how well each product protects against malware. This is determined by real-world testing carried out by Dennis Technology Labs (DTL) – an independent research facility operated by one of our sister publications. DTL also monitors how security software handles non-harmful software: unnecessary alerts can be dangerous, since they encourage users to disregard warnings. Some suites offer a “silent” mode, but this can obscure false positives rather than preventing them.

The first graph below shows each package’s malware-protection score in DTL’s most recent tests, where 100% represents a perfect record in protecting test systems against malicious software. For false positives, DTL uses a points-based system: we’ve converted this to a percentage rating, using the best performer (Microsoft Windows Defender, also known as Microsoft

Security Essentials) as our 100% benchmark. From these two percentages, we award an overall score for malware protection, weighted towards the protection score, which is shown in the graph as a dotted line.

Another important question is how much of an impact the security product will have on the performance of your system. We test this using the Explorer and Applications tests from our Real World Benchmarks suite. By combining each package’s scores for protection and responsiveness, we arrive at our rating out of six for Performance.

The significance of this score depends on your hardware. On a powerful system with a high-speed SSD, you’ll notice little difference between packages. On a low-power tablet or convertible, the performance gap between two products can be significant. We test using an HP Envy x2 hybrid laptop with an Intel Atom Z2760 processor and 2GB of RAM.

Again, Windows Defender serves as our 100% performance baseline: disabling

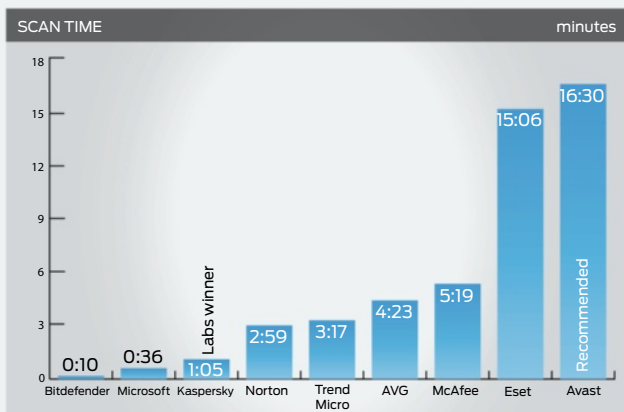
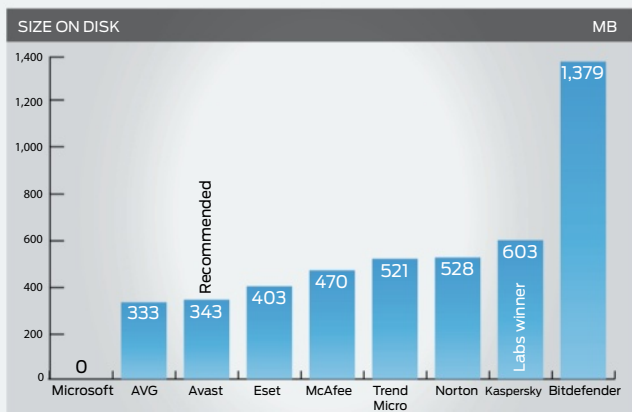
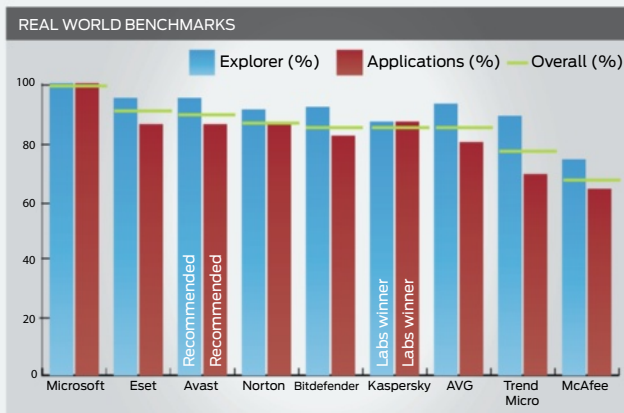
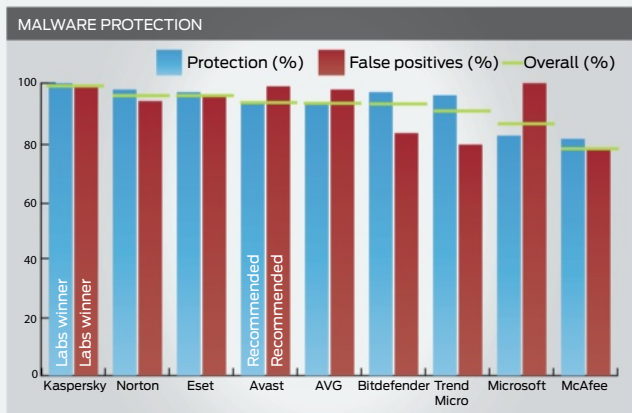
Defender can gain you a few percentage points of performance, but we don’t recommend running without protection. Naturally, Defender is automatically disabled when you install a third-party suite.

The graphs along the bottom show how much space each package takes up on disk – important if you’re working on a tablet with limited flash storage – and the time taken to complete a quick system scan.

Our other star ratings are self-explanatory. The Features rating represents the breadth of useful functions the software performs in addition to the basic task of scanning files, emails and web pages for malware. Ease of Use is a subjective rating that reflects how clear and intuitive we find the interface. The Value for Money score represents how far the protection and features offered by each package justify its street price.

Finally, the Overall score is the average of the other four star ratings, giving an at-a-glance indication of the software’s capabilities and affordability.

RESULTS



VOLOS

GAMING MOUSE

THE MOUSE FOR EVERY BATTLEFIELD.

"THIS IS EASILY ONE OF THE BEST MICE ON THE MARKET TODAY AND IT ONLY GETS BETTER WHEN YOU SEE THE PRICE TAG"



- 16.8 MILLION CUSTOMIZABLE COLORS.
- 14 CONFIGURABLE BUTTONS.
- INTERCHANGABLE WEIGHTS.
- ON-THE-FLY DPI ADJUSTMENT.
- 140 PROGRAMMABLE MACROS
- LOCK-OUT FUNCTION SWITCH



VISIT WWW.TTESPORTS.COM.AU FOR INFO

Premium Resellers Online

Mwave	1300 727 446	mwave.com.au
PCCG	03 9551 0889	pccasegear.com.au
Scorptec	1300 726 770	scorptec.com.au
Umart	07 3369 3928	umart.com.au
Online Comp	02 9211 0898	onlinecomputer.com.au

NSW

Dcomp	02 4721 7885
Octagon	02 8212 5161
MSY	02 9648 4116
PC DIY	02 9648 1001
NorthShore	02 9939 1548
Online Computer	02 9211 0898

SA

MSY	08 8212 1656
PC DIY	08 8410 0446

VIC

Nexus	03 9663 9988
PC DIY	03 9077 9811
Scorptec	1300 726 770
Centrecom	03 8311 7600
CPL	03 8542 8688
MSY	03 9560 2288

QLD

Computer - Alliance	07 3421 3200
Gamedude	07 3387 1531
MSY	07 3217 9070
Umart	07 3369 3928

WA

Austin	08 9201 2788
MSY	08 9344 1002
PLE	08 9309 4771



DAYZ STANDALONE

THE GAME RELEASES IN EARLY ACCESS MODE ON STEAM – BUT IS THIS ALPHA RELEASE REALLY WORTH IT?

DEVELOPER Bohemia Interactive
PUBLISHER Bohemia Interactive
WEBSITE <http://dayzgame.com/>

In one of his last updates to the DayZ dev blog tumblr, Dean ‘Rocket’ Hall, the game’s creator, made an interesting, and somewhat surprising, admission. “We strongly advise you not to buy and play the game at this stage,” he said, “unless you clearly understand what Early Access means and are interested in participating in the ongoing development cycle.”

Annoyingly, it’s something that cannot be said enough. All across Steam and various DayZ community forums, there are cries that the Standalone, or SA, release is broken, or it’s not with the money, or ... whatever. It’s a shame because Hall has been very up-front from the get-go about what your \$30 currently gets you – a chance to test the game in a very early, very limited form.

While the reaction of some short-sighted players may be disappointing, what’s very surprising is just how good the game is in its current form.

Hall’s wish list for this year seems like an essential set of points for the main game. Animals and hunting, vehicles that you can repair and customise, crafting, and improved game physics are all there, and all currently missing. There are only two long-arms in the game, and a single pistol, and player numbers are limited to 40, and the loot spawns are a little odd, forcing many server admins to go with regular restarts just to keep loot available. And one game update even forced a complete wipe of player characters; this game is very much a work in progress, and there’s a bug-list as long as my arm, from random items going missing from your inventory, to rubber-banding and player teleporting, to zombies that can clip through most buildings. Also, there’s not a lot to be done once you’re fully equipped – which was a flaw of the mod, as well.

And yet... there’s just nothing like DayZ SA on the market. Already, it’s one of the most oddly, darkly compelling games we’ve ever played. It’s open in some amazing ways, yet



does some wonderful things with forcing players into certain actions.

At its heart, the game is about survival, and always has been since its early mod days. In its current incarnation, though, it’s players you have to worry about. The zombie count is currently being kept quite low, at least until server-side code is improved. This makes the shambling undead rather easy to deal with, apart from the aforementioned tendency to run through walls and doors when you least expect it. (And, odd as it is, it’s uber-scary!) Still, zombies outnumber real humans, but those humans and



their inherently complex motivations and behaviour add the real wildcard to the game.

Seeing fast movement in your periphery is enough to make you freeze and hide, no matter how well geared you are. Seeing someone who's fully geared, in military duds and toting an assault rifle, is enough to make you turn tail and run.

But player interactions are richer than simply killing on sight. There are a host of medical conditions now to worry about, including diseases that can spread between players, and other injuries that require blood transfusions – and since blood type is now something in-game, and you can store blood, there are already teams of players going around collecting blood for later sale to other survivors.

The apocalypse is a harsh place.

New gear, like handcuffs and rope, also make these interactions either more fraught, or easier to handle, depending on which side you're on. The condition of all gear is now very important, which adds another wrinkle

to the shoot-first, loot-later philosophy. You may well be able to blow someone away with a burst from your M4, but chances are the corpse will then have no useable loot – it'll all be 'ruined' by the impact. There's a lot of food, but some of it is rotten, which can lead to illness and even death. Even getting wet is dangerous, and it can be handy to have spare clothes to change into to avoid catching cold.

Thankfully something that's improved even in this version is the inventory management, and managing that inventory is more important than ever. Everything from your shirt and pants, to your choice of pack and other items, has some kind of carry capacity. You can hotkey up to ten items, but otherwise you'll want to make sure you have the most important items in things like your shirt, or a utility vest. All your carrying items are listed on-screen top to bottom, and you have to spend more time to scroll to anything in your backpack, which is always the last item – a clever way to make it feel like it is more awkward to

PLATFORMS PC

rummage through that big pack.

The game is looking good, too, despite not utilising the full new engine for Arma III. Rather, it's running off Arma II code with a bit of code from its sequel thrown in, and some entirely new code from Hall. Sunlight dapples through tree branches, and player models and items are all beautifully realised. Blood effects are still overdone though, and also prone to clipping, making for some disturbing blood showers when someone is bleeding out on a floor above your current camping spot.

Ultimately though, it's all one big blank canvas for some amazing stories and encounters. There's already a tonne of emergent gameplay coming to the fore, and with many more systems to be built, the game's only going to become more complex. In our opinion, it's very much worth getting into now – you're getting a game unlike any other, and one whose evolution you can be a direct part of.

That's pretty neat.

David Hollingworth



STATE OF THE MOD: NAPOLEON: TOTAL WAR

FOLLOWING THE ABJECT DISAPPOINTMENT THAT WAS ROME 2, **DAVID HOLLINGWORTH** LOOKS BACK TO THE MODDED PERFECTION THAT IS CREATIVE ASSEMBLY'S NAPOLEON

DEVELOPER Creative Assembly
PUBLISHER Sega
WEBSITE <http://www.totalwar.com/>

For a long time, I'd always claimed it was practically impossible for Creative Assembly to make a bad game. Sure, it produced the woeful Stormrise, but that was more the exception that proved the rule – as long as the company stuck to historical battles, it was on a winner.

But Rome 2 changed all of that. I've sunk over 100 hours into pretty much every Total War release – but I couldn't make it more than 20 hours, if that, into my Rome 2 campaign. That's just... depressing. And it must be astoundingly depressing to the developers of the game, who are very aware of their game's issues. To their credit, they've been very upfront about getting the game fixed, and have even suggested that, currently, the best way to enjoy the game is to use mods from some of the guys who've been modding the series for decades, especially Radius – his complete mod updates have always been superb.

However, the thing with Total War in relation to mods is that, generally, the base game itself is compelling to start with. I did play a bit of Rome II with Radius' work, and, while it was an improvement, some of the base elements of the game still annoyed me way too much.

I've not gone back to Rome II since then, though I may be tempted to give the Caesar in Gaul DLC a go to see how it is now.

VIVE LA REPUBLIC!

With three weeks off over the recent Xmas break, it occurred to me that it was a perfect chance to get in some Total War time, and with Rome II well and truly out of the picture, I looked back through my collection and made the choice I usually do – Napoleon. The not-quite sequel to Empire: Total War, Napoleon was critically well-received, but did split players. Being one of my favourite periods, and polishing the great mechanics that were introduced in Empire, it's one of my favourite strategy games of all time.

It's also now over three years old,

which is good in a few ways. For one thing, on modern hardware, it now looks stunning; for another, it's a known quantity, though still has a lot of replay potential – perfect for





maximising fun during a break. Lastly, though, and most importantly, the modders have been working in the game constantly. In fact, one of the best mods – DarthMod Napoleon (<http://www.moddb.com/mods/darthmod-napoleon>) – was released in an Epic Edition last March.

Well, sign me up.

Even from installation, the DarthMods have always felt more like official patches – there's no messing about with moving files or changing .ini files in notepad – it 'just works'. For all that simplicity, though, you really are getting an amazingly fresh and rich experience. It stands out even more when compared to the somewhat stagnant nature of Creative Assembly's own development of the series – by its own admission, it's been working on the same AI codebase since Shogun, and it's starting to show. The perfect case in point is the AI's complete inability to utilise basic resources and tactics, such as mounting naval invasions, pretty much making any AI campaign ridiculously easy, no matter the

difficulty setting.

DarthMod Napoleon Epic Edition takes that code and makes it sing, however. AI nations now wheel and deal like real 19th century entities, making and breaking alliances, sharing technologies, and manoeuvring across both the strategic and tactical maps with startling alacrity. You'll see navies actually approaching your home territories with boarded armies; if you're used to playing as England, and pretty much being able to ignore the idea of being invaded, it's terrifying. Your enemies will block trading routes in clever spots, go after your trade ships, and even convince your allies to abandon you – even to declare war!

In the game I'm playing, Prussia has made the choice to ally with Austria to fight England – me! So far the only allies left to me are Portugal, some Nordic countries, and Russia. It's very ahistorical, but has all happened very organically – it's emergent gameplay of the best kind.

There's also a vastly richer array of units, which brings alive the colour and

PLATFORMS PC

pageantry of the period. And each of those units is larger, and is part of a far larger army – battles are something to be seen with the mod installed, thanks to this variety and scale, and also the way units move. You now get proper columns of French infantry attacking, which is a sight to see, and the tactical AI is both more cautious, and more aggressive – it'll use cavalry to probe your flanks, for instance, so if you're not careful you can find your entire line getting rolled up. The same goes for the naval battles, which were always spectacular, but with new battlefield sound and graphics effects, are like actually being there.

And all of this, and so much more, from someone doing it all for love of the game. If, like me, you have been left with a bad taste in your mouth by Rome II, it really is worth going back to older games like this and enjoying what the mod-makers have to offer.

In a lot of ways, they're doing superior work to the developers, taking the engine and code to new heights.

David Hollingworth

THE A-LIST

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

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

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

ALSO RECOMMENDED

▶ ADOBE LIGHTROOM 5

★★★★★

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



PCS DESKTOPS ▼

HIGH-END TI DELUXE 4670K

★★★★★

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

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

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



GAMING SCORPTEC THERMALTAKE GTX 760 PC

★★★★★

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

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

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



ALL-IN-ONE APPLE IMAC 27IN

★★★★★

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

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

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



HANDHELDS ▼

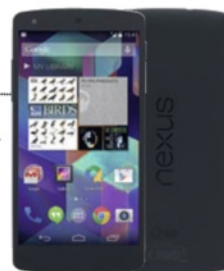
SMARTPHONE NEXUS 5

★★★★★

PRICE From \$399 SUPPLIER www.google.com

At half the price of some more popular phones, the Nexus 5 still delivers incredible performance and battery life, with pure KitKat goodness!

SPECIFICATIONS 2.3GHz Quad-core Snapdragon CPU; 16GB internal memory; 4.95in 1920x1080 IPS display; 8MP camera; 136g



TABLET APPLE IPAD AIR

★★★★★

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

The new iPad is pretty much the king of the hill when it comes to tablets, smaller and more powerful than ever before.

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



EBOOK READER KINDLE

★★★★★

PRICE \$109 SUPPLIER www.amazon.com

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

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



PCS LAPTOPS ▼

VALUE ASUS X202E

★★★★★

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

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

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



GAMING VENOM BLACKBOOK 17

★★★★★

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

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

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



HIGH-END LENOVO THINKPAD X1 CARBON

★★★★★

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

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

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



ULTRA PORTABLE DELL XPS 13

★★★★★

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

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

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



PERIPHERALS ▼

WIRELESS ROUTER ASUS DSL-N55U

★★★★★

SUPPLIER www.asus.com.au

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

SPECIFICATIONS 802.11a/g/n wireless router; 4 x Gigabit Ethernet ports; 2 x USB; PPOE; PPP; L2TP; 145x63x174mm.

DESKTOP STORAGE SEAGATE 2TB BACKUP PLUS DESKTOP

★★★★★

SUPPLIER www.seagate.com

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

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

NAS BUFFALO CLOUDSTATION 2TB

★★★★★

SUPPLIER www.buffalotech.com

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

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

ALL-IN-ONE PRINTER CANON PIXMA MG5460

★★★★★

SUPPLIER www.canon.com.au

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

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

LASER PRINTER DELL B1160W

★★★★★

SUPPLIER www.dell.com.au

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

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

SOFTWARE ▼

SECURITY KASPERSKY INTERNET SECURITY 2014

★★★★★

SUPPLIER www.kaspersky.com/au

The winner of this year's security software group test, a big improvement over recent years, and a good solution for beginners and more advanced users.

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 7.5

★★★★★

SUPPLIER www.steinberg.net

The addition of better filters solidifies this program's continued 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.

OUT OF DATE?

While we still stand by everything in our KitLog, there's no denying that it's all getting a little long in the tooth, and some of it isn't even available any more!

We've always intended the KitLog to be very much based on real world needs, and to that extent do not want to pack it with needless upgrades when the current hardware can do the job perfectly well. Which, in the current climate of hardware far outstripping software demands... means these systems – which are very close to what we actually use – haven't seen a lot of changes.

But that, ironically, is going to change.

John and I are planning on a big PC building special in a few issues, and we're each going to focus on a different kind of build, and these builds in turn will be what our new KitLog is based upon. These will be systems we plan to use ourselves, in real-life, real-computing, real-gaming situations. As we see new kit we absolutely must have, we'll be sure to update it; you'll know that it's not based just on score alone – it will be something we personally endorse. So watch this space!

THE GAME BOX

CPU



INTEL CORE I5 3570K

PRICE \$245

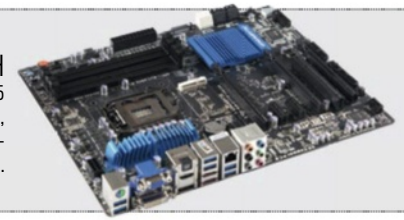
Remove the Hyper Threading, and save \$150? DEAL! You can always opt for a non-K version CPU if overclocking isn't your thing.

MOTHERBOARD

GIGABYTE Z77X-UD3H

PRICE \$185

Affordable gaming performance and features, without the overkill seen with a lot of gaming-specific motherboards on the market.



MEMORY



G.SKILL RIPJAWS
F3-12800CL9D-8GBXL

PRICE \$55

Great value, decent performance, and some flexibility. RAM is universally cheap now, so higher capacities are still viable for budget builds.

VIDEOCARD

GIGABYTE HD7870 OVERCLOCKED

PRICE \$260

Performance close to the 7950, with a pricetag nowhere near. It also looks like there won't be new GPUs for a while yet, so this card will last a while.



THE PERFECT PC

CPU



INTEL CORE I7 3770K

PRICE \$350

8 Threads of Ivy Bridge efficiency. Overclock for justice! This CPU is so good it has rendered the Socket 2011 enthusiast platform redundant.

MOTHERBOARD

GIGABYTE G1 SNIPER 3

PRICE \$380

It's about as super-premium as you could get, or want, thanks to added features like SoundBlaster audio and Killer NIC.



MEMORY



CORSAIR VENGEANCE LOW PROFILE
CML16GX3M4A1600C9B

PRICE \$120

16GB of fast memory. Virtualise everything! The low profile design means that it won't fight for space with your cooling solution.

VIDEOCARD

MSI GTX N780 LIGHTNING

PRICE \$960

Overkill for most people, this card delivers amazing performance and incredible overclocking ability – you won't need to upgrade for years!



SUBTOTAL: **\$1694**RIG ONLY: **\$1084**

COOLER



ANTEC KUHLER 620

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

CASE



BITFENIX RONIN

PRICE \$99
Bitfenix continues to deliver great budget cases that look and build great.

SYSTEMDRIVES

2TB HDD
PRICE \$90
2000 gigabyte storage drive on the cheap. 3TB are coming down in price too.



PIONEER DVR-219L

PRICE \$35
Discs. You needs '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

TT ESPORTS CRONOS

PRICE \$80
Fantastic set of headphones that delivers great 2.1 audio for gaming and music without swamping you with bass.



ONBOARD REALTEK ALC889A

PRICE NA
A decent chip that does the job.

POWER SUPPLY

SILVERSTONE STRIDER 500W

PRICE \$65
A solid PSU, capable of powering much more if you ever choose to upgrade.

SUBTOTAL: **\$4645**RIG ONLY: **\$3530**

COOLER



CORSAIR H100i WATER COOLER

PRICE \$160
Fits perfectly in the Cosmos S II, mounting directly on the roof!

CASE



COOLER MASTER COSMOS II

PRICE \$400
The only case you'll ever need. Premium luxurious bliss.

SYSTEMDRIVES

OCZ REVO DRIVE 3 X2 & WD 1TB VELOCIRAPTOR
PRICE \$490 + \$350
Superfast SSD and zippy storage make for a monstrous system indeed.



KEYBOARD

RAZER BLACKWIDOW ULTIMATE

PRICE \$160
Mechanical gorgeousness.



DISPLAY



ASUS PB278Q

PRICE \$690
One of the best 27in monitors on the market, with a pricetag that makes us forget the competition even exists.

MOUSE



RAZER OUROBORUS

PRICE \$135
An excellent performer and highly configurable mouse that suits both left- and right-handers.

AUDIO

PLANTRONICS RIG

PRICE \$130
For sheer features and flexibility, possibly the best cans on the market today.



POWER SUPPLY

ANTEC HCP 1200W

PRICE \$320
Plug in a graphics card. Or four. The HCP won't care, coping with everything you throw at it.





GREAT REASONS TO SUBSCRIBE

SAVE YOURSELF \$48 OFF THE COVER PRICE!

NEVER MISS OUT ON THE BEST TECH REVIEWS AND PC ADVICE FROM AUSTRALIA'S PREMIER COMPUTING MAGAZINE.

GET EVERY ISSUE DELIVERED FREE DIRECT TO YOUR DOOR!

PC & TECH AUTHORITY DIGITAL EDITIONS

If you'd prefer to read us on your mobile, tablet or computer, you can also now purchase a digital edition of the magazine! Visit au.zinio.com/pcta or itunes.com/app/pcandtechauthority



Call 1300 610 765 to subscribe
and quote code 1132

6 ISSUES FOR JUST \$27

Subscribe to PC & Tech Authority today and you'll get your first six issues for only \$27 - **that's just \$4.50 an issue!** You'll then continue to save money, paying only \$40 for every six issues thereafter*



Subscribe online at www.subscribeNOW.com.au/pca/1132

Offer is only available to new Australian subscribers who respond to this offer before 10/3/2014. Please quote '1132' when ordering subscription by phone. For overseas rates and terms and conditions, visit www.pcauthority.com.au/subscribe or call +61 2 8296 5496.

HYPER»

SCI-FI SPECIAL

FEATURING:

TITANFALL
DESTINY
STAR CITIZEN
TRANSISTOR
JAPANESE FUTURIST BOOKS
VAULTS OF FALLOUT
HYPER'S TOP 50 SCI-FI
CHARACTERS

ON SALE NOW

HOW TO

Each month our experts get under the hood to provide you with detailed How To guides on hardware, software and everything in-between.

SYSTEMBUILDER

Decommissioning an old PC



84

HOW TO

Make the most of mobile data



88

HOW TO

Find the right amount of RAM



92



SYSTEM BUILDER:

Decommission or sell on an old PC

DAVID BAYON EXPLAINS HOW TO SELL OR DISPOSE OF AN OLD SYSTEM SAFELY, WITHOUT COMPROMISING PERSONAL DATA

When a PC is nearing the end of its useful life, it's crucial to decommission it safely and securely. It's a simple process, and once it's done you can dispose of the PC, or sell it on, without worrying about what else you may be giving away. If you do plan to sell it on, there are steps you can take to encourage buyers and help achieve a quick sale at a good price.

PERSONAL DATA

The most important part of decommissioning an old PC is securely erasing your personal data. This is to ensure that nothing can be recovered by whoever gets their hands on your PC, or its hard disk, after you've finished with it.

Before you start the decommissioning process, therefore, make sure you've collected all the data and information you need from the computer. For a PC you plan to sell or strip for parts, it's always good to have a full specification list to give to buyers. If you don't have the original documents, or if the computer has been upgraded over the years, go in to Control Panel | System & Security | System and note down the processor model, the amount of RAM and - if you plan to restore the PC before it goes - the version of Windows it's running.

Then open Device Manager and note down the model numbers under Disk Drives and Display Adapters, and anything else you think might be of interest to a prospective owner. Doing this now will be much simpler than digging up the details later. You can also enlist the help of a third-party tool such as Speccy (www.piriform.com/docs/speccy), which can analyse the hardware in your system and produce



“There are steps you can take to encourage buyers and help achieve a sale at a good price”

a full report as a text file.

Next, if there's data you want to keep, be sure to transfer it to an external hard disk or upload it to a cloud storage service such as Dropbox or Google Drive. It's also a good idea to de-authorise any software with an account that works across multiple devices, such as Apple's iTunes and Adobe's Creative Suite tools. This takes only a minute, and it reduces the possibility of future authorisation issues with other devices. Finally, dig out your original installation discs and decide what's worth including: you must hand over the product keys if you want to bundle commercial software with the machine.

If you intend to sell off the PC's individual components, it's also a good idea to take a few photos of them in action before you erase the hard disk, as we discuss below.

SELLING THE WHOLE COMPUTER

If you plan to sell on the computer in one working piece, you'll definitely want to securely clean off the hard disk (see *Secure wipe*, p97). Once you've done this, you may want to reinstall the OS to make it a more attractive purchase. If you still have the installation disc or recovery media for Windows 7 or 8, along with a valid product key, this should be a simple process. If your system came with older XP or Vista discs, buyers may prefer the option of receiving the system without an OS. One possibility is to install Ubuntu to show the system is working.

You should already have made a list of the technical specifications, but if you plan to sell your PC via an online service (see *Shopping around*, right), it's also a good idea to take

**RECOMMENDED PERIPHERALS
FOR YOUR BUILD**

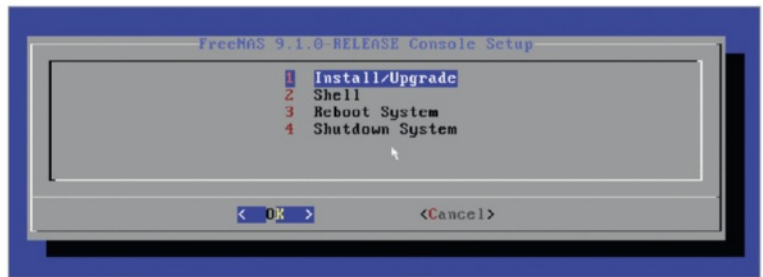
**Knucker
Keyboard**
RRP: \$69



a set of clear photos. You don't need to get the professionals in, but it pays to take your shots in a well-lit room and against a clean, preferably white background. Show the device powered on and working if possible, and take shots from different angles to show ports and connectors. If you have recovery discs, manuals, peripherals and cases, be sure to include them in at least one photo. Don't show the product key: someone dishonest could use it to illegally activate their own copy of Windows, leading to problems with your own installation.

For an eBay listing, the key information should go into the description and headline. Be clear about the condition and age of the device, and if at all possible include the full model number or product name. You're an individual seller, not a business, so be human and tell the buyer why you've decided to sell. And before you set a price, search for similar products online and see how much they tend to fetch. If you're brave enough to run an auction that starts at 99c, you'll receive more interest, although you need to have realistic expectations of how high the bidding will go.

As for shipping, assume your computer is going to be chucked around like a rugby ball in transit. If you no longer have the original



▲ You can turn an old PC into a network storage device using the open-source FreeNAS system

packaging, you're going to need lots of bubble wrap. Always use a few more layers than you think is safe, and if you're putting multiple items into a larger box it pays to pack the free space with packing chips. For a PC, stuff more bubble wrap into the spaces inside the case to prevent components from coming loose. And the most important step: always get a tracking number!

SELLING INDIVIDUAL COMPONENTS

If your PC is no longer functional, you can still sell off the bits that do work. Indeed, even if your PC does work, it may be more lucrative to sell off the most desirable components. This applies particularly to custom-built and upgraded PCs – perhaps you've supplemented a standard PC with a beastly graphics card, for example. That component alone may be what prospective buyers are really after.

You'll have to use common sense here. Check the prices at retail and on eBay for the components you want to sell, making sure you're using the exact product codes. The notes you took earlier should help here: you can also open up the PC and look for a sticker or engraving that confirms the part number. Alternatively, look back through your emails for an order receipt. If possible, take a photo that shows the component working, and state very clearly the condition of the item in your listing. It can be a lottery buying secondhand components, so do everything you can to reassure potential buyers.

If you're wary of selling online, a trade-in shop such as CeX will take pretty much anything you can stick into a PC without fuss, so long as it's in working order. Be warned, though: they may take the item away for testing before handing over the cash, which can mean leaving it with them

Shopping around

When it comes to selling a working PC or laptop, don't automatically assume eBay is the answer. It does have the biggest audience, but you'll have to factor in its selling fees, not to mention the cost (and considerable effort) of safely shipping something bulky and valuable.

There are alternatives. As a way to massively reduce the time and effort involved in selling a laptop, trade-in shops such as CeX (<http://au.webuy.com>) will take some big-brand systems immediately in return for cash. Don't expect to get rich, though: these stores are buying your products to sell them on at a profit, so there's a good chance you'll get considerably less than you would from a private sale – if the shop will take your system at all.

Then there are websites specialising in personal advertisements, the most popular being Gumtree (www.gumtree.com.au). Although its



audience is more localised than eBay, it costs nothing to list an item, and you get the reassurance of a fixed asking price and no commitment to sell.

If things don't go well, you can simply create a new listing for your item – with a few tweaks to the headline or price. With collections, you'll have to be more careful than you would on eBay: don't give out



your address or phone number until you're happy you've found a serious buyer and, if necessary, have someone with you when the buyer arrives.

There's no hard and fast rule governing the best way to sell off a given item. Take stock of what you have and go for the approach that you think will work best.

**Cronos
Headset**
RRP: \$129

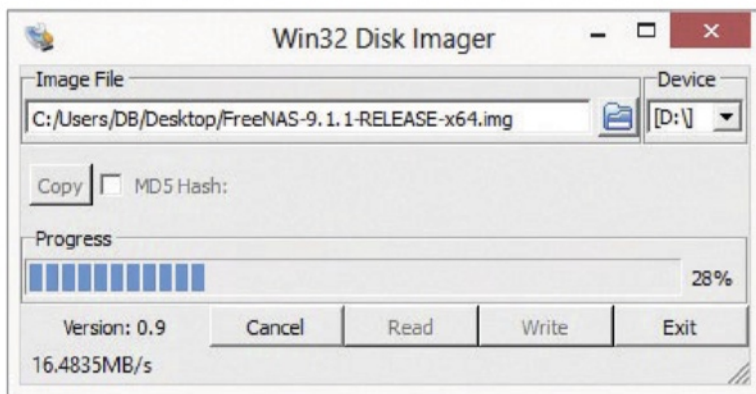


**Theron
Mouse**
RRP: \$99



Tt esports
By Thermaltake





▲ Use image-burning software to create your bootable FreeNAS media

for several hours or even overnight. And before you lug everything down to the high street, check the website to see what you'll get for sale or trade-in: with older kit you may find it isn't worth the effort.

If you can't find a new home for your kit, you can always repurpose it. It might be possible to move spare memory into a newer PC as a top-up, and working hard disks of a reasonable capacity are always useful. USB 3 external hard disk caddies can be had from around \$20 for 2.5in laptop drives, and around \$40 for 3.5in desktop drives, turning an old SATA disk into a high-speed backup device. Don't put all your eggs in this basket, though: if it's already a few years old, it could fail on you sooner or later.

TURN AN OLD PC INTO A FREENAS

An old, working PC that's too slow to run the latest applications can be repurposed as a home server by installing the open-source FreeNAS operating system. Be warned that the system is quite RAM-hungry, so if your system has less than 2GB you may

need to add more to get FreeNAS running smoothly.

You should also be aware that a computer running FreeNAS will almost certainly consume more electrical power than a dedicated NAS appliance. To keep things as efficient as possible, see if you can underclock the CPU in the BIOS, and remove any physical components the PC doesn't need to serve files. You don't need a separate graphics card, for instance, if the system also has integrated graphics.

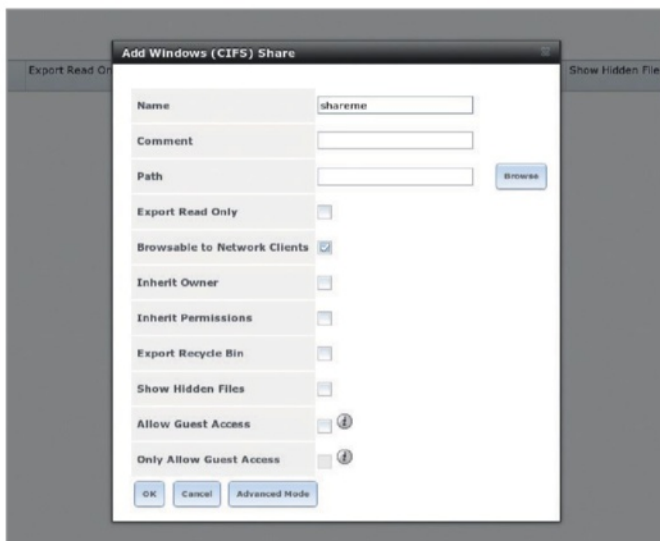
To get started, go to www.freenas.org and head to the Download page. You can burn the FreeNAS ISO onto a CD and use that to create a bootable USB drive, but it's easier just to create the USB drive directly. Click the Disk Image tab at the bottom of the page and choose the latest 32-bit or 64-bit release of FreeNAS 9. Unzip the downloaded archive with a tool such as 7-Zip (www.7-zip.org) and copy the IMG file onto your desktop. Then download the free Win32 Disk Imager tool

(<http://sourceforge.net/projects/win32diskimager/>), unzip and run it, and select your IMG file and the letter of your USB drive. Click Write and your bootable FreeNAS USB stick will be created.

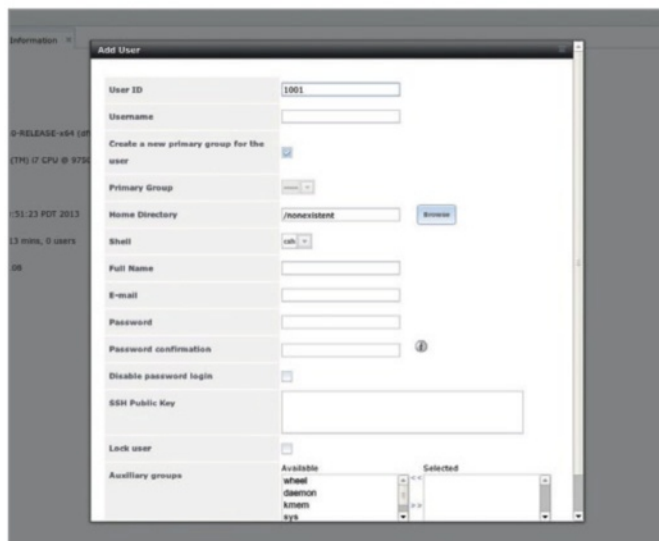
To set up your FreeNAS server, you'll need access to a second PC that's connected to the same home network. Boot your old system from the USB stick, and after a few minutes it should give you a numbered menu with an IP address at the bottom of the screen. If no network is found, choose the first option to Configure Network Interfaces and follow the instructions until it detects an IP. (For bigger problems setting up, you're best off checking the FreeNAS forums.)

Write down that IP address, then type it into the browser URL bar on the other PC to access the FreeNAS web interface with all the settings for your new home server. To get started, go to Account | Admin Account | Change Admin User, and set a username and password. That's for the web login, but you also want to create a new user for the server in Account | Users | New User. Browse through the rest of the administrative settings to fix any obvious problems - such as an incorrect time or date - and you're ready to set up your storage.

Go to Storage | Volumes | Volume Manager to add a new hard disk, then name it and select it from the connected drives. The file system is important: if your home server machine has anything less than 4GB of RAM, be sure to choose the legacy UFS over the more intensive ZFS. Then click Add Volume and your drive will be wiped and prepared for use in the server; repeat the process for any other drives you want to repurpose. To



▲ Once FreeNAS is up and running, it's easy to create shares...



▲ ... and then set up user accounts to determine who can access them

make the volume accessible, go to Sharing | Windows (CIFS) Shares | Add Windows (CIFS) Share, give the share a name and navigate to the relevant drive. It should then show up as a password-protected network drive on your other PCs. You can also set up shares with guest access, but you may need to fiddle with the permissions if you want guests to be able to write to the share.

“An old, working PC can be repurposed as a home server by installing FreeNAS”

There's much more you can do with your new home server, including setting up automatic downloads and streaming media across the network. A full list of available plugins is on the FreeNAS site, along with instructions on setting them up, so head over there if you're feeling brave.

DISPOSING OF HARDWARE

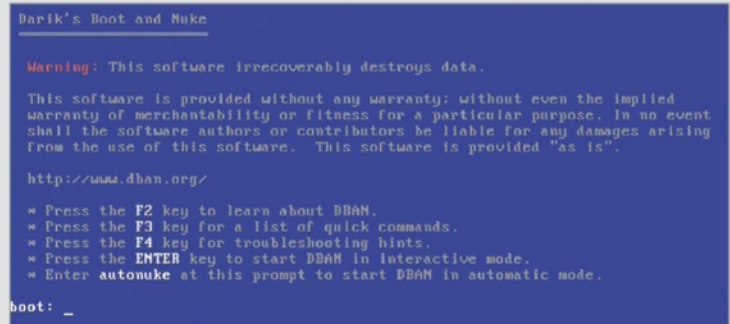
If your hardware is too old or decrepit to be worth selling or repurposing, consider whether you might have - for example - an older relative who needs only email and a web browser. If that doesn't apply, you can always give your PC to charity. There's a number of state and national charity services in Australia that will either pick-up or are happy for you to drop off old machines, after which they are refurbished and passed on to schools, the disabled, etc. A quick Google should find something close by.

Alternatively, try a site such as www.freecycle.org to see if there are people in your area looking for the type of hardware you're looking to dispose of. It won't make you any cash but it will get the hardware off your hands. If you take this route, it's vital that you carry out the secure-erase process, since you won't know where your PC is going.

If all else fails, it's time to look into disposal options. Some companies will take back hardware when you no longer need it. Dell, for example, will collect your old computer for free - even including other-branded systems if you've recently bought a new Dell PC, monitor, printer or mobile device.

The last resort is the dump. Don't simply turn up to any dump and chuck your hardware in with everything else: PCs contain all sorts of toxic chemicals that need to be handled appropriately. Visit your local council's website or search on <http://recyclingnearyou.com.au> to find a recycling plant that accepts electronic goods. That way you can be sure that although it isn't going to a new home, your trusty old PC will at least do some good in its next life.

Secure wipe



Reformatting your hard disk, or restoring Windows from a recovery partition, will remove any visible trace of your files - but it may not remove the data. All a quick format does is set a marker to indicate files are no longer available, with the contents remaining on the disk until more data is written over the top. Even if you install a fresh copy of Windows, it will overwrite only a portion of the disk: sensitive data could still be hanging around elsewhere on its platters, and a data-recovery application may be able to bring that data back. Few buyers will have the expertise or desire to resurrect your personal data, but why take the risk?

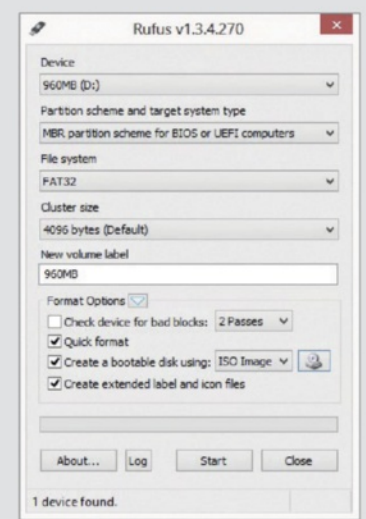
There are plenty of tools that can wipe a disk securely. We've chosen the free Darik's Boot and Nuke (DBAN) utility, which you can download from www.dban.org. As the documentation explains, "DBAN is a means of ensuring due diligence in computer recycling, a way of preventing identity theft if you want to sell a computer." It works by completely overwriting a disk with random data before finally blanking it, so that nothing that was there before can be recovered. Ignore the disclaimer that DBAN offers "no guarantee that data is removed" - it's more than good enough to secure consumer drives.

DBAN 2.2.7 comes as a small ISO file that you'll need to burn to a blank CD or DVD. In Windows 7 or 8, you can right-click the ISO and choose Burn disc image; for earlier versions of Windows, use a third-party tool such as the free CDBurnerXP (<https://cdburnerxp.se>). Make sure any option to make the disc bootable is ticked.

If you don't have a CD or DVD drive, you can use a USB stick. Download the free Rufus utility at <http://rufus.akeo.ie> to easily create a bootable USB drive from the downloaded ISO file. Be sure that "Create a bootable disk using:" is ticked and its dropdown is set to "ISO Image", then click the small icon to the right and navigate to the DBAN ISO file.

Once you've created your DBAN media, boot your PC from it and at the first menu simply press Enter to begin the process. At the Disks And Partitions screen, press Space on each of the drives you intend to wipe. You're free to change the random-number generator (press P), the wipe method (W), and the verification options (V), but it's fine to stick with the defaults - the standard settings are more than robust enough. As for the number of rounds (R), it's often claimed that more is better, but in fact overwriting a drive only once will almost certainly make it unrecoverable, even by forensic experts with specialist hardware. Each DBAN round writes three passes of random data, so we'd leave this at the default of one.

When you're absolutely certain you're ready to start wiping your drive, press F10. The screen will fill with text, before being replaced by a running progress report as each drive is run through three passes before being verified as empty. DBAN took close to eight hours to fully wipe our 500GB laptop hard disk, so put the kettle on and make other plans for the day.



HOW TO: Conserve your mobile data

STAYING WITHIN YOUR ALLOWANCE CAN BE A CHALLENGE. **DARIEN GRAHAM-SMITH** SHOWS YOU HOW TO MAKE THE MOST OF YOUR MONTHLY MOBILE MEGABYTES

We Australians love our mobile data connections. According to recent ABS research, half of all website traffic in Australia comes from a mobile or fixed wireless – and we'd imagine mobile alone is a large proportion of that. And we also like to use a lot of data while we're on the road, too. 1GB of data is considered the defacto standard for a mobile contract, with power users often going with 2GB or higher contracts.

This isn't necessarily a problem. According to an OECD (the Organisation for Economic Co-operation and Development) study published in July 2013, we live in the cheapest country in the world to run a smartphone.

All the same, data isn't free. Committing to a large monthly data allowance can cost you a significant amount over the course of a two-year contract. Yet if you opt for a smaller cap, then use up your whole allowance during any given month, you'll be charged extra for additional "out-of-bundle" usage. If you can keep your data usage within reasonable limits, you can save real money.

HOW MUCH DATA DO YOU GET, AND HOW MUCH DO YOU NEED?

Before you worry about reducing your data usage, start by working out whether you actually need to. If you don't know your monthly data allowance, you can normally check it on your provider's website, or by giving them a call. Getting the measure of how much data you actually use involves a bit more work: your month-to-month usage should be detailed on your bills, but the precise figure will naturally fluctuate from one period to the next. Digging back several months will give you a good idea of your average usage – and whether it's stable or gradually creeping upwards.

Once you know this, you can start making changes. It may be that you



don't need to reduce your usage: if you have a 500MB monthly bundle but use only 200MB in a typical month, there's nothing to be gained by cutting back. It might even be worth contacting your provider to see if you can save money by moving down to a 250MB allowance – even if you occasionally go over the lower limit, you may well end up saving money overall.

For most of us, however, it's more

likely that we'll be close to our data threshold, with consumption gradually growing as everyday services move online. Most providers will help you avoid going over your cap by sending you a text message when you're getting close – but when a message such as this arrives, it's too late to do anything other than pare your usage right back for the remainder of your billing period.

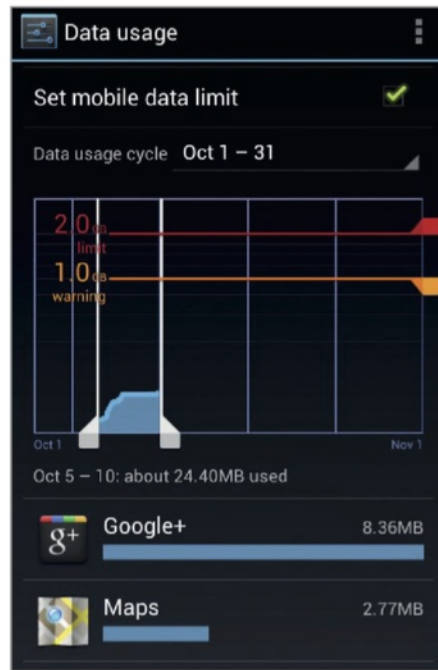
TRACKING YOUR USAGE

You can normally keep track of your usage by logging on to your provider's website every week or two and checking how much of your allowance remains. Some providers – including EE and Vodafone – offer their own apps for iOS and Android that can give you a running tally. You don't need these, however: almost all phones (and 3G/LTE-equipped tablets) come with built-in software to track activity on mobile networks.

This approach comes with a caveat, since on-device records may not precisely square with what your provider thinks you've used. This can happen, for example, if you're in an area of poor coverage and your device is having multiple tries at sending and receiving data packets. It's conceivable that you could end up being charged for exceeding your limit even if your data monitor thinks you've stayed just within it. So it's still a good idea to drop by your provider's website every so often, to check whether its records have drifted significantly apart from yours.

Android users will find the data-monitoring tool under Settings | Data Usage. It shows a graphical representation of how much mobile data you've consumed in any given month – tap the "Data usage cycle" dropdown to tell it the date on which your billing period starts – and if you scroll down, you'll see a breakdown by app.

Android also warns you when you pass a certain data-usage threshold. By default, it's set at an unhelpfully high 2GB, so most people will never see it, but if you tap the "2.0GB warning" text you



▲ All Android devices include a handy tool for monitoring which apps have been using data



▲ iPhone users can keep an eye on their data usage within the iOS settings menu

can change it to something more useful. If you're really allergic to excess charges, you can also tick "Set mobile data limit" to automatically disable all mobile data communications once you pass a specified monthly threshold. Remember to account for the possibility of your mobile provider thinking you've used more data than your phone has recorded.

Windows Phone offers a similar tool, called Data Sense. You'll find it in the App list: tap the Settings button within the app to set up your monthly billing period and your data limit. A tickbox lets you "Restrict background data when I'm near my limit" – so that things such as Live Tile updates and email updates are suspended automatically. Data Sense doesn't alert you when you get close to your limit, but you can pin its tile to your Start screen to see a running total of how much mobile (and wireless) data you've used in your current period.

For iPhone and iPad users, iOS 7 keeps a record of your data usage in Settings | Mobile. Within this menu you'll see a headline total of data used, plus, if you scroll down, a breakdown of how your various apps have contributed to that total. Tap on "System services" to see how much data things such as Siri and Find My iPhone have used.

Unfortunately, iOS 7 has no facility for warning you when your data usage passes a certain threshold. In fact, it doesn't keep track of your billing cycle at all: if you want to measure your monthly data usage, you'll have to come back every month and hit the "Reset statistics" button at the bottom of

the Settings page.

For that reason, you may choose to install a third-party app that provides that function. In addition to the various providers' own-brand offerings, there are plenty of options in the App Store. One popular choice for iOS is My Data Manager (<http://tinyurl.com/pp9sn3r>). This lets you set custom alerts – so you can, for example, receive a notification when you've used 33% of your data allowance, then again when you hit 66% – to ensure you don't get any sudden shocks. The software is available for Android too, but Windows Phone 8 users are left out: the API doesn't allow a third-party app to monitor another app's network connections, so it isn't possible to create a usage-monitoring tool on this platform.

USE WI-FI WHERE POSSIBLE

It's sensible to try to minimise your data usage, but ideally you don't want to give up the features and conveniences of your smartphone. The simplest way to reduce your mobile data usage, without changing your habits, is to use Wi-Fi instead wherever possible. Set up your phone to connect whenever it's in range – not only at home, but if possible then also at work and at the homes of friends and family members. It might be going a bit far to insist on logging on every time you visit a café or pub, but if you want to download an attachment, or to spend a quiet ten minutes surfing the web over a cup of coffee, it's worth checking

App Updates

Both Android and iOS 7 automatically download and install updates to your installed apps as they become available. By default, they'll do this only over a Wi-Fi connection, so you shouldn't get any nasty shocks when a 100MB update for the latest game comes down the line.

It's possible to change this behaviour, however, to allow a mobile data connection to be used. On Android, you'll find the option in the Google Play app, under Settings. In iOS, the "Use Mobile Data" option can be found under Settings | iTunes & App Store. With this enabled, software updates will be downloaded by your phone as soon as they become available, even if you're using a mobile connection at the time.

Clearly this is a good way to gobble up data in rapid, unpredictable chunks – so we don't recommend it, unless you have a very generous data allowance indeed.

If you do feel the need to update an app while you're away from a wireless connection, it's much more efficient to update only the app in question. On both Android and iOS, you can open the relevant interface – be it Google Play or the App Store front-end – and hit Update on an individual app to perform a one-time update over your mobile data connection.

to see if there's a wireless network over which you can do it for free.

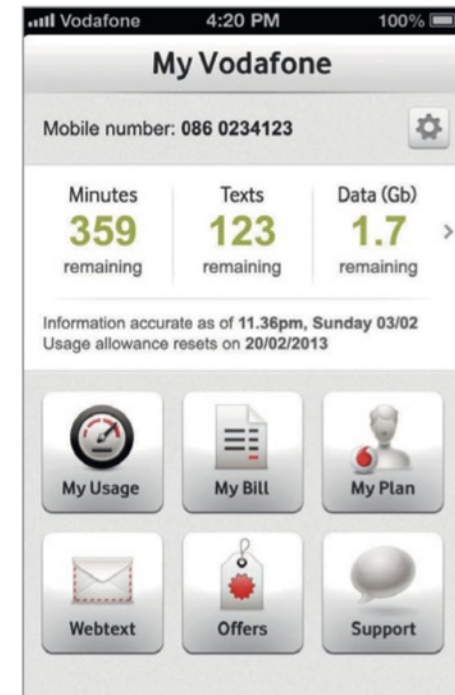
Also check whether you're entitled to use random hotspots elsewhere. Internode, for instance, lists businesses and other locations that partner with the ISP for wi-fi coverage, from the Australian War Memorial in Canberra to the The Hula Bula Bar in Perth. You can also easily Google any other location you frequent to find out if there are handy hotspots nearby.

REDUCING THE DATA DRAIN

When you're using mobile data, there are some simple steps you can take to cut data usage without degrading your experience. One is to use native apps rather than web services wherever possible. The overhead of downloading a graphics-heavy page, and all its client-side code, every time you load a page can be significant (see *Apps vs Websites*, opposite).

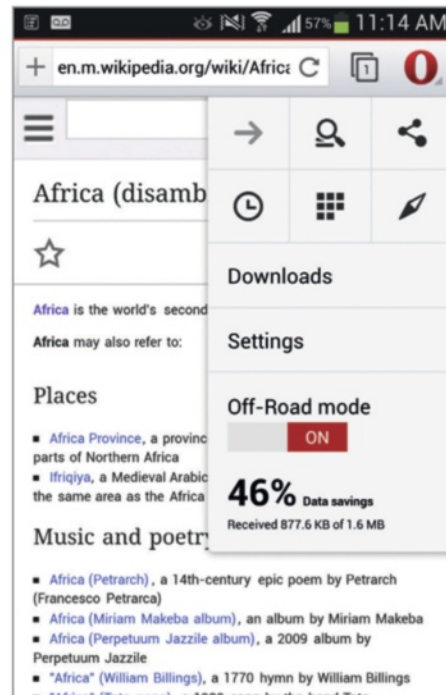
If an app isn't available, the next best thing is to make sure you're browsing mobile websites where possible. In most cases, where a service offers both desktop and mobile-friendly interfaces, they'll detect that you're coming from a smartphone and automatically route you to the lightweight site, so this won't normally be a problem - but it's worth keeping an eye on.

One place where it may be a good idea not to spare your data is when it comes to sharing images with friends. The cost of sending a photo



▲ Some mobile providers offer bespoke apps that you can use to keep an eye on your data allowance

via MMS is typically 20c or more, depending on your network provider. If you can instead share the image via an online service such as email or Twitter, the effective cost is zero - so long as it doesn't push you over your cap. Avoid emailing full-resolution images if you don't need to: the JPEGs from a 13-megapixel phone camera



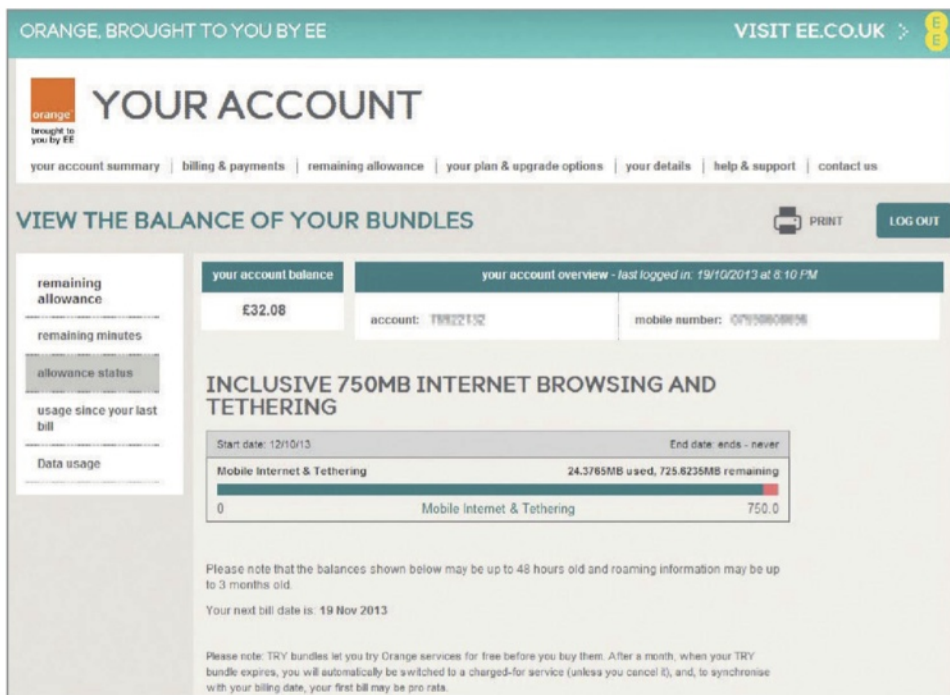
▲ The mobile versions of Opera and Chrome can route web pages through a proxy server that compresses the HTML and image data

can weigh in at more than 2MB apiece. Instead, use an app such as Facebook and Twitter, which will automatically reduce the resolution and apply extra compression to crunch your pictures down to around 100KB.

You can also install a browser that's designed to minimise mobile data usage. The Opera mobile browser, available for Android and iOS, features an optional "Off-Road" mode, which routes pages through a proxy server that compresses online data and images before they're sent to your phone. The developer claims that this can reduce data usage by 90% while browsing, and since pages are smaller, they load more quickly, too.

A similar feature is offered by Chrome for Mobile: you can activate it by visiting Settings | Bandwidth Management | Reduce data usage. Needless to say, using a proxy in this way has some privacy implications, but HTTPS connections bypass the proxy and go straight to the original server. That may be a reason to opt for Chrome over Opera Mini, which doesn't currently support end-to-end encryption at all.

One final but controversial way to cut your data usage while browsing is to install an ad-blocking app. Not everyone agrees with using this type of software, since it reduces a website's ability to make money from visitors. You may also need to root your Android phone, or jailbreak your iPhone to make it work (at present there's no way



▲ Keep track of your usage by logging on to your provider's website every week or two

to block ads on Windows Phone). If you can live with that, however, blocking popular ad providers will reduce the amount of data you download as you browse around the web.

DATA-SAVING COMPROMISES

If you really need to dial back your data usage, there are certain activities you'll just have to avoid. An obvious place to start is streaming: YouTube videos can eat up around 3MB per minute. If you use the Spotify app, check your quality settings – the "Extreme" setting will download 320Kbits/sec streams that can eat up around 7MB for a three-minute pop song; slash this by choosing "High quality", which halves the bit rate to 160Kbits/sec, or "Normal quality", which drops it to 96Kbits/sec. Or set Spotify to use offline playlists only, so you can listen to local music without having to pull any songs in over the air. It's a good idea to avoid downloading apps over mobile data, too, and to check that your phone isn't set to automatically pull updates over the expensive airwaves (see App

updates, p53).

If you're going on a journey, plan your route beforehand. In our test, spending a mere two minutes picking out a route in Google Maps on Android gobbled up 4MB of data, so it's best to do this on Wi-Fi before you set off. You can temporarily cache the area by tapping the magnifying glass icon, then scrolling to the bottom of the menu and tapping "Make this map area available offline". For iOS users, Apple Maps automatically caches nearby map data.

If you're up against the wall in terms of data usage, consider temporarily turning off automatic syncing for tasks such as email and Facebook. In Android, you'll find the option tucked away in the menu options of the Data Usage tool.

It's even possible to restrict background data completely, although this will prevent services such as Calendar and Google Play notifications and installations from working properly. On iOS 7, you'll want to go into General | Background App Refresh and either turn off the feature entirely, or selectively disable it for specific apps. For Windows Phone users, automatic syncing is automatically disabled when

Battery Saver mode is activated, and Live Tiles will stop receiving push notifications.

One last point worth making is to use mobile hotspot functions with care. There's nothing inherently wrong with sharing your mobile phone's

"You can install a browser that's designed to minimise mobile data usage"

data connection with other devices, but those other devices will see the connection as a regular wireless network, and may therefore assume it can be used for data-heavy operations such as downloading app updates. If you're connecting from a Windows 8 tablet or laptop, you can set the connection to metered to stop the OS from automatically downloading Windows updates, syncing SkyDrive files and updating Live Tiles on the Start screen. You can do this by going into the PC Settings screen, then tapping Network | Connections and clicking the appropriate switch.

Apps vs Websites

To see what a difference apps can make, we tried using some popular web services on a smartphone, first via their web interfaces, and then using the official Android apps. We carried out the same operations in each, and, using Android's built-in Data Usage monitor, tracked how much data was exchanged in the process. Here's what we did.

eBay Search for a specific item, wait for the results page to load, then click on the first result returned and click through to view a detailed description.

hungryhouse Search for the nearest pizza restaurant and add a margherita pizza to our basket for delivery to a

home address.

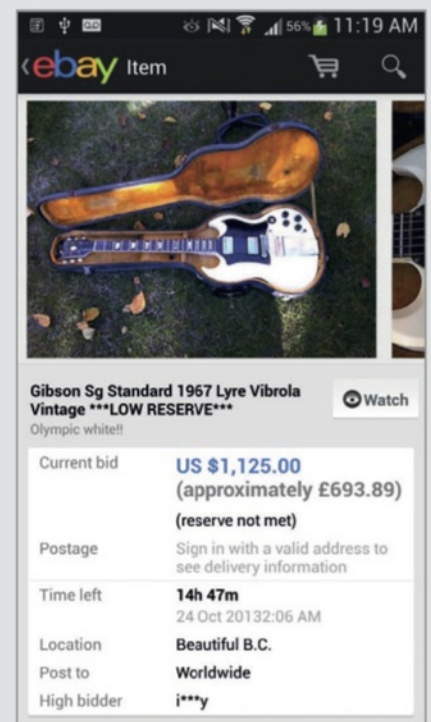
Twitter Load the timeline, switch to the Connect view to see all our replies and retweets, then post a test tweet.

Facebook Load the timeline, then tap on a recent update and view all comments.

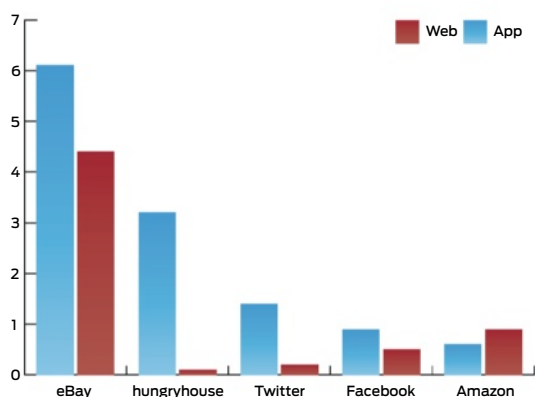
Amazon Search for a specific item, wait for the results to load, then click on the first returned and click through to view a detailed description.

As you can see from our graph, using native apps almost always resulted in a far more efficient experience – the one exception being Amazon, whose mobile website is already ruthlessly optimised to minimise bandwidth demands. The biggest individual winner was our image-heavy eBay search, but the Twitter and HungryHouse apps together saved us a further 4.3MB in a matter of moments.

It's clear that using native apps is a no-brainer. Indeed, most of these apps weigh in at less than 10MB – the one exception being the 16MB Facebook app – so even if you're away from a wireless



network, it may make sense to download an app over your mobile connection than to carry on using the web interface. If you're not in a hurry, it's best to wait until you're on Wi-Fi, then load up on all the apps you think you may need in the future.



HOW TO:

How much RAM do you really need?

MORE MEMORY DOESN'T ALWAYS MEAN BETTER PERFORMANCE – IN FACT, YOU MAY NEED LESS RAM THAN YOU THINK. **DARIEN GRAHAM-SMITH** EXPLAINS

Typically, today's budget PCs come with 4GB of RAM. A mid-range configuration may offer double that, and high-end gaming systems and workstations go as high as 16GB or more.

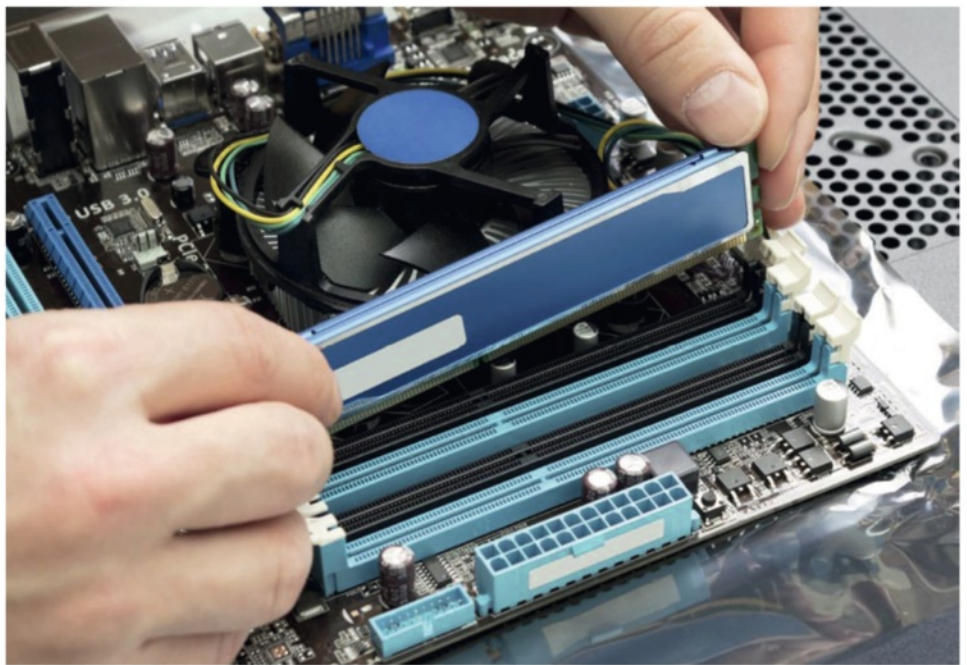
There's no doubt which way the wind's blowing, either: Windows 8 supports up to 128GB of physical memory (assuming you're running the 64-bit edition), while Windows 8 Pro can go up to 512GB.

Does anyone really need this much RAM? Memory isn't as expensive as it used to be, but there's obviously no point paying for gigabytes of RAM from which you'll receive no material gain.

DOES MORE EQUAL FASTER?

Many people assume that adding memory makes a PC significantly faster, and in some cases it does. Sticking an extra pair of DIMMs into a motherboard won't change the speed at which the processor executes code, but it can help in other ways, especially on older systems with 2GB of RAM or less, since adding RAM reduces the need for Windows to rely on "virtual memory".

Simply put, virtual memory is a file on your hard disk that serves as temporary storage when your PC's "real" memory is full. Virtual memory



"If you've set Windows Explorer to show hidden files, you can see the swap file in the root directory..."

makes it possible, for example, to have several heavyweight applications running at once, even if they won't fit simultaneously in RAM. When you switch from one to another, Windows quickly swaps the relevant data from the disk into real memory, which explains why the virtual memory file is sometimes called a swap file. If you've set Windows Explorer to show hidden files, you can see the swap file in the root directory of your system disk; depending on which version of Windows you're using, it will be called `pagefile.sys` or `swapfile.sys`.

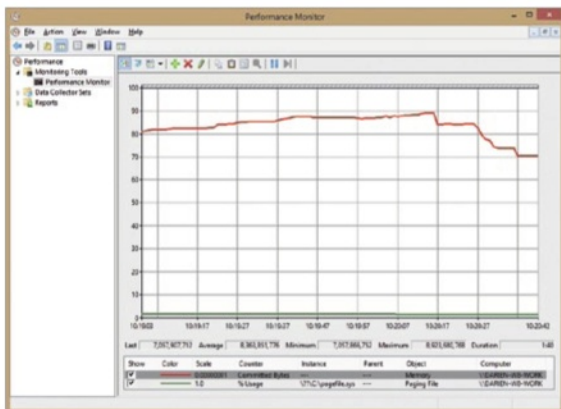
The process of shuttling data to and from the swap file slows things down, especially if you're using an old-school mechanical disk. The situation gets worse if you try to open a new program when your memory is full: the disk

head ends up repeatedly "thrashing" back and forth across the disk as it tries to read the new data into memory while simultaneously moving older information into the swap file. The result is a slow and unresponsive PC.

If you've ever used Windows XP on a machine from the late 1990s or early 2000s, you'll almost certainly have sat through your fair share of disk-thrashing sessions. Although contemporary 32-bit PCs were theoretically able to address up to 4GB of RAM, memory was expensive, and a high-end system may have come with only 256MB installed. A reliance on virtual memory was a fact of life – hence the rule of thumb that you should install as much memory as you can afford.

DIMINISHING RETURNS

This rule is much less applicable today



▲ You can track your memory usage in various programs via Windows Performance Monitor

than it was a decade ago. Today, a new PC will come with multiple gigabytes of RAM, so Windows relies much less on virtual memory. It's almost certain to come with a solid-state system drive rather than a mechanical one, making the process of swapping data between RAM and virtual memory much smoother. Also, since SSDs have no problem reading from one flash memory cell while writing to a different one, it also effectively eradicates the problem of "thrashing".

All the same, real memory is still faster. While a high-end SSD might read and write data at around 600MB/sec, a DDR3 DIMM running at 1333MHz/sec can transfer more than 10GB/sec (you can calculate the peak transfer rate of a DDR3 memory module in megabytes per second by multiplying its operating frequency by eight). This means your system will be more responsive if you can fit all your applications and documents into physical memory.

Memory and performance

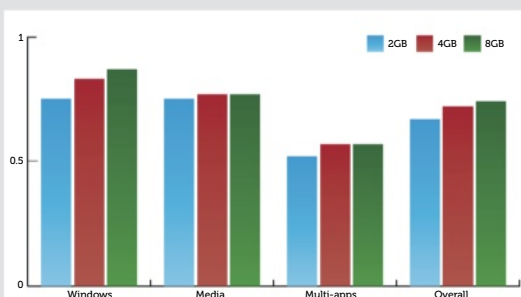
We've mentioned that the high transfer speeds of a modern SSD make virtual memory less painful than it once was. But what does this mean in practice? To find out, we ran our Real World Benchmarks on our test system, equipped with 2GB, 4GB and 8GB of RAM. Our findings are shown in the graph below.

Clearly, even with an SSD, adding more memory speeds things up. We saw the most pronounced effect in our Windows test, which involves repeatedly opening and switching between applications. With only 2GB onboard, Windows had to make regular use of virtual memory; going up to 4GB let it keep everything in memory, bringing a performance increase of 11%; and adding a further 4GB provided extra headroom for SuperFetch, which delivered an additional 5% boost.

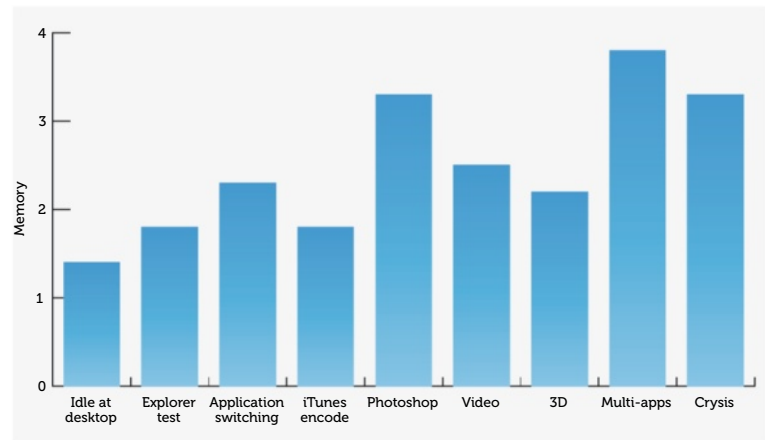
In the Multi-apps test, things were less clear-cut. Moving up from 2GB to 4GB gave us a similar speed improvement of 10%, but adding RAM beyond this point didn't help, presumably because the system wasn't idle for long enough to allow SuperFetch to do its thing.

In our Media exercises, which rely on number-crunching rather than file access, adding memory had almost no effect on performance.

Overall, the difference between a 4GB system and an 8GB one was only 3%. You might consider that significant enough to justify an upgrade, but it's nowhere near as transformative as you might expect.



Committed memory



There's a second benefit to having plenty of RAM on hand. Ever since Vista, Windows has included an under-the-bonnet feature called SuperFetch that tries to predict which applications and libraries you're most likely to want to use. It also pre-emptively loads them into RAM in the background while the system is idle. The more spare RAM you have, the more likely it is that the next application you open will have been pre-cached, enabling it to spring up almost instantly, rather than having to load from the disk. For an illustration of the benefit you can gain from extra RAM, see Memory and performance, left.

HOW MUCH IS ENOUGH?

SuperFetch will use as much memory as you can throw at it, but since it intelligently anticipates which program you're most likely to open next, it shouldn't require dozens of gigabytes to be effective. Also, once you have enough RAM to fit your entire workload into memory, virtual memory becomes a non-issue. The question is: how much memory do you need to achieve peak performance without wasting money?

There's no "one size fits all" answer to that question. Everyone's workload is different, and while you may have a good idea of your current requirements, it isn't always possible to anticipate what you'll need tomorrow. However, you can get an idea of how your usage might stack up by exploring how much memory is used in various scenarios.

This is easy to do through the Windows Performance Monitor, a handy system tool that lets you keep track of dozens of important operating metrics, including "committed bytes". This represents the total memory that's been allocated to your applications and OS components (it doesn't include

the SuperFetch cache, which is automatically flushed if the RAM is needed by a "real" program).

The graph above shows the peak levels of committed memory as measured by Performance Monitor during the various stages of our Real World Benchmarks, which were carried out within a clean installation of Windows 8.1 on a Dell XPS 12 laptop with 4GB of RAM. We also ran our standard Crysis benchmark with Very High detail.

CONCLUSION

Even during our Real World Multi-apps test - which opens several major applications at once - our test system's total RAM usage never topped 4GB. This means Windows didn't need to fall back on virtual memory at any point. As such, installing more RAM would yield only a modest speed boost.

However, this doesn't necessarily mean you should avoid paying for more than 4GB. If your work is unusually demanding - such as processing 4K video files, or working with very large databases - you may well need more memory than this. Also, there's a distinct possibility that, as memory prices continue to fall, everyday applications will evolve to take advantage of ever-higher quantities of RAM. What's more, many ultra-slim laptops aren't user-upgradeable, so if you're buying a new system today, you might reasonably opt for an 8GB model, just to be assured of a degree of future-proofing.

For current tasks, however, adding memory beyond 4GB seems to yield sharply diminishing returns: we've yet to see any application - outside of extremely specialist data-processing tasks - that genuinely benefits from 16GB. It seems the days when you could never have enough RAM are, thankfully, behind us.



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.

Facebook gets proactive

DAVEY WINDER IS IMPRESSED BY FACEBOOK'S RESPONSE TO THE ADOBE HACK, CHAMPIONS SOCIAL MEDIA EDUCATION AND OFFERS PASSWORD-CREATION ADVICE

Regular readers could be forgiven for thinking I don't like Facebook, given that I'm always pointing out the stupid things it does. Truth be told, I'm a real social network addict, so you should regard such scolding as the behaviour of a concerned parent chiding a child to buck up its ideas. And yes, I do see Facebook as something of a stropky teenager (even though it won't be ten until February 2014 - they grow up so fast these days).

For the record, I've been using online social media for more than 20 years - as have many of the contributing editors of the Real World Computing section - and it's because I see Facebook repeating the mistakes of others before it that I may come across as a little harsh. Even so, as a father of twin boys who are about to hit their teens, I understand the benefit of giving praise when it's due - and it's due right now. Indeed, while Facebook has upset many of its users recently by blocking their accounts and insisting they reset their passwords, this is actually great news.

Let's make this absolutely clear: it isn't Facebook that's been hacked, breached or otherwise compromised, so far as I or anyone else knows - it's Adobe. If that confuses you, then you need to take more notice of the advice I give on these pages month after month, in particular, "Don't reuse your passwords". To cut a long story short, Adobe's website was compromised when attackers managed to access its source-code databases and customer databases that contained 38 million user IDs and encrypted passwords. This login data quickly found its way onto the Dark Web - the chain of underground sites favoured by cybercriminals - where it's now readily available to anyone who wants to find it.

I've taken a look at the password



“ Friends added to Facebook's Restricted List will only see content flagged as public ”

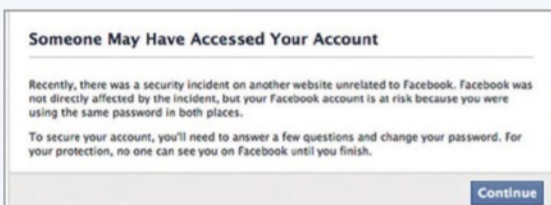
dumps - as have Facebook's security teams. Around two million of the Adobe customer passwords are no more complex than "123456", while half a million of them go a little further and use "123456789". It isn't hard to see why this is a problem: if any of these users have reused these same terrible (or even complex) passwords across different sites and services, one breach has the potential knock-on effect of unlocking access to all of their accounts. This is the reasoning behind Facebook's proactive block-and-reset campaign.

I applaud Facebook - everyone from the security team that conducted the data mining, to the executives who signed off the difficult decision to lock out active users until they verify their identities and reset their passwords - for taking this incident so seriously. Other services should take this stern approach, too, and look at breaches outside their own network that may have an indirect impact on them. Had the popular MacRumors forum (<http://forums.macrumors.com>) done this, it might not have fallen victim to a hack attack that followed a pattern similar to that of the Ubuntu forums hack earlier in the year. In turn,

this attack can be traced all the way back to vBulletin 4, with the result that the vBulletin.org forums were compromised and member passwords exposed.

Many forums run on the vBulletin platform, which means that many forum administrators, moderators and developers have accounts there. It seems one MacRumors moderator is among them, and that he or she used the same password for both sites. As a result, the hacker was able to escalate privileges and access user login credentials - potentially more than 860,000 of them. If only that moderator had not been so naive as to reuse their password; if only MacRumors had spotted the potential for compromise following the vBulletin breach.

I help out as an administrator for a large IT developer support forum, and as soon as it became clear that MacRumors had fallen foul of this knock-on effect from the vBulletin breach, all of our moderators were required to reset their passwords to prevent exactly this possibility. It took only a few minutes to post a message to the mods concerned and log them out of the system in order



▲ Facebook blocked users caught up in Adobe's database compromise

to enforce the reset (and that's for a forum that doesn't even use vBulletin, but operates on a proprietary in-house platform). Seriously, folks - how many times do you have to receive an email from a breached service, or read about such emails being sent out, that contains the advice, "If you use the same password for other sites, please change it immediately", before the message starts to sink in?

I know that choosing a complex and secure password or passphrase can be a pain, but there are plenty of guides to help you construct one - see ours at <http://tinyurl.com/mtsjn8>). Similarly, there are plenty of password managers (<http://tinyurl.com/o2teh9p>) to help you create, manage and store them securely.

BIY - BLOCK IT YOURSELF

Blocking people on Facebook, Twitter and the like is a measure many see as a last resort, which I understand. After all, the whole point of social networks is to interact with groups, and blocking people doesn't fit with that premise. However, I'm happy to swim against the stream and admit that I regularly visit the Facebook blocking pages at <http://tinyurl.com/qfc85s2>. I don't usually do so to block people, though. Blocking doesn't have to be limited to removing irritating fools from your virtual life - it can be applied equally to annoying apps, event invitations and so on.

However, before I get on to such matters, allow me to make a suggestion: if you have friends to whom you don't want to grant full access to everything you post - but whom you don't want to unfriend - use the Restricted List function that you'll find at the top of the blocking pages. Friends added to this list will only see content you've flagged as public - and they won't be notified that you've put them on the list.

Anyway, back to blocking pages. Perhaps the most annoying thing about Facebook is the pervasiveness of those damned apps - for everything from virtual stockbroking to sweet-exploding - that other people find so addictive that they're compelled to invite all their friends, including you, along for the ride. There are a couple of ways to deal with this insanity. The first is to block app invites from the user concerned, which means all future app requests are automatically ignored. This works to a degree, but if you receive many requests from different users of the same app, it's more effective to block

Block app invites	Once you block app invites from someone, you'll automatically ignore future app requests from that friend. To block invites from a specific friend, click the "Ignore all invites from this friend" link under your latest request.
<div>Block invites from <input type="text" value="Type the name of a friend..."/></div>	
Block event invitations	Once you block event invitations from someone, you'll automatically ignore future event requests from that friend.
<div>Block invitations from <input type="text" value="Type the name of a friend..."/></div>	
Block apps	Once you block an app, it can no longer contact you or get non-public information about you through Facebook. Learn more.

▲ Whether it's a human or an app that annoys you on Facebook, it's easy to set up blocks

the app itself.

I do this at the first hint of a problem these days, which means when the first "have you tried" or "fancy a game of" posts appear. Just type in the name of the app to block it; once you've done that, it can no longer contact you or find out non-public information about you via Facebook. Also, if you're fed up with certain friends inviting you to too many "events", Facebook has an answer for that, too: use the "Block event invitations" option for a specified user and all future event requests will be automatically ignored.

SOCIALISER, EDUCATE THYSELF

Security vendor Eset recently commissioned a survey that revealed 82% of us now use social media, with the obvious effects on security and privacy that brings. Interestingly, 64% of users believed they were responsible for their own online safety, yet only 28% could be bothered to read the privacy policy of the services they use. This disconnect should come as no surprise to anyone working in the IT security industry, since we see

it all the time; Eset's research simply reinforces it.

For example, despite an overwhelming majority of respondents saying it was their responsibility to manage their social network privacy settings, only one in five had made any changes to them. This was despite the fact that 28% admitted their accounts had been hacked and 33% said they'd flagged suspicious activity and items to the system. Of the 28% who were hacked, 30% were notified by friends in their circle. With a third of users receiving suspicious social network messages this year, and one in five encountering malware links on social media, it's vital that people start putting what they believe about responsibility into practice.

Maybe that should start with education, considering that only 27% of those asked said they'd received social media safety training. In fact, I don't know why I said "only" - I'm surprised it's that high.

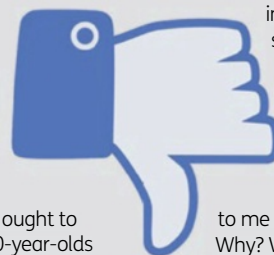
Here's a thought: if we're responsible for our own social media safety, this implies that we're also responsible for the safety of those in our social media networks. So, why not reach



DAVEY WINDER
Award-winning journalist and small-business consultant specialising in privacy and security issues.

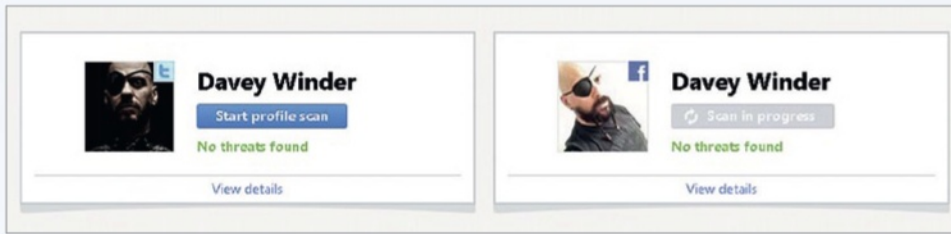
The Facebook family

According to a recent survey, family members aren't immune from being shunned on Facebook. You might think the social network is precisely where family members ought to meet, but 36% of 18-30-year-olds questioned in the NetVoucherCodes.co.uk poll had unfriended a relative, and 21% had refused to accept a friend request from a family member



in the first place. Not surprisingly, 47% had refused or unfriended a parent (a statistic that certainly reflects my own experience, since roughly half of my children won't talk

to me on Facebook). Why? Well, 21% cited a belief that their parents would spy on them, while 78% said they would feel "constrained" in their Facebook usage.



▲ Do yourself a favour and get your friends into social scanning – it could make a real difference to your online security

out to your own circle of friends – be they on Facebook, Twitter, LinkedIn, Google+ or wherever – with a post that suggests they check the privacy and security policies, and offers to answer any questions they have about making their accounts more secure?

You might also want to point them in the direction of a profile scanner, such as the ones for Facebook and Twitter that are available for free from Eset (<http://tinyurl.com/kgblnqv>). These products will scan your newsfeed, messages and timeline (plus the timelines of your friends) on Facebook, and profiles and posts on Twitter, for malicious links and the like. You can even sign up for a free online account that lets you perform both scans at once.

Just as it pays to read things properly before clicking on anything in your social networks, so it does with apps such as these. By default, they'll warn authors of potentially malicious messages and advise them to remove the content, which makes sense – but only if the false-positive count is very low. I've unchecked this option, since I'd rather inform anyone via a personal comment; after all, these are "social" networks.

Likewise, to say I'm not keen on apps that post stuff publicly on your accounts would be something of an understatement, so I opted to allow the Eset Social Media Scanner to post stuff privately – visible only to me – instead.



Profile scanners will scan your newsfeed, messages and timeline for malicious links



WHEN PASSWORDS BITE BACK

The problem with passwords can usually be summed up in three words: simplicity, memory and reuse. People tend to choose less secure passwords since they're easier to remember, and this is often compounded by the habit of reusing the same insecure password for every site and service. Without doubt, this is seriously concerning.

Sometimes, however, an unorthodox password problem hits you from left-field and leaves you reeling, which is exactly what happened to reader Roger P when he purchased a new MacBook Pro with Retina display from his local Apple Store.

Roger isn't your typical security noob; in fact, he takes this data-protection stuff very seriously and follows industry advice, such as employing a password vault. This is why his experience is so surprising.

Roger installed his usual password – a complex one that contains the euro symbol (€) in several places – to restrict access to his account on the MacBook Pro. He then downloaded 1Password v4 from the App Store and copied his 1Password keychain file from his previous MacBook Air onto the new machine. At this point, things took a turn.

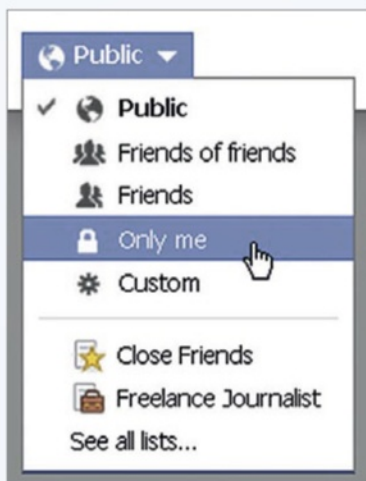
When the 1Password login screen appeared and Roger entered his password, it was rejected. After spending a good while troubleshooting the problem, Roger realised the Apple Store had sold him a machine with a US keyboard layout. This meant that hitting Alt+2 didn't produce the € character, as it would on a European keyboard.

The problem wasn't immediately obvious to Roger, since all his previous MacBooks purchased from Apple Stores in the UK (where he lives) had UK keyboard layouts. Not being able to see your password by default as you enter it doesn't help, although this option can be configured to display the input if you need to troubleshoot. I wouldn't recommend disabling the asterisk option permanently, however, since you never know who may be watching you type.

I'm glad Roger got to the bottom of this issue, and I can sympathise, since I've been in a similar position myself. I recall being in a hotel room in Seattle without my laptop, since I'd opted to travel light on this occasion. The only "smart" device I had with me was a Palm Pilot 1000 (which should date this anecdote fairly precisely). I'd decided I could keep in touch with my email via that internet thingy and the awfully clever connected TV in my hi-tech hotel room. The trouble was, my password included a pound sign, and the keyboard I had was a US one. Worse still, there was no way of changing this on the system in use in that room, not even by an experienced hacker such as me. The lesson I learned was to avoid using in my passwords non-alphanumeric symbols that are keyboard-layout dependent.

VOTE OF CONFIDENCE

Talking of stupid security, let's finish with one of those occasional snippets that provoke utter disbelief. This one is courtesy of Will R, whose local council sends him a voter-registration form every year, and every year he's amazed to see that three pieces of information are required in order to register via the website. The three pieces of information are the postcode and two separate security codes – all of which are included in the same letter... ■



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're offering a tonne of great software. From CyberGhost and the ability to hide your IP address and use the internet anonymously, to an excellent iOS data recovery app, there's something useful here for everyone.

And we have another new Linux OS, the easy and convenient Puppy Linux - who's a good boy!

Plus we have all our usual updated software and applications that are essential to your PC.

CyberGhost VPN 5



HIDE YOUR IP ADDRESS AND SURF ANONYMOUSLY

CyberGhost VPN lets you surf anonymously by hiding your IP address and replacing it with that of the server you choose to connect to, making it impossible for hackers, third parties or other organizations to track you or meddle in your business.

PROTECT YOUR PRIVATE DATA

Every time you connect through CyberGhost VPN a protective tunnel is formed around your information and all your data becomes encrypted. You don't have to worry anymore about passwords, financial transactions or private conversations.

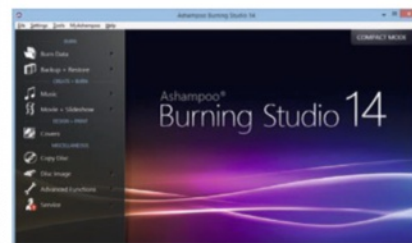
Leawo iOS Data Recovery

Lost all your invaluable photos, significant MMS & SMS messages, important contacts, and recorded videos in the blink of an eye? Stricken with the stupid wrong deletion or unexpected corruption of your iPhone, iPad and iPod touch? No matter what the data killers of your iOS devices are, the first aid method of data recovery is here – Leawo iOS Data Recovery software.

- Recover lost data from iPhone, iPad & iPod touch directly
- Retrieve files from iTunes backup even for lost or broken iOS devices
- Restore 12 types of data, including photos, videos, SMS & MMS messages, contacts, call history, notes, calendar, etc.
- Fully support all iPhone, iPad & iPod touch models – iPhone 5s, iPhone 5c, iPad Air, iPad mini 2 (with Retina display) & iPod touch 5 included

- Totally compatible with all iOS versions, including the latest iOS 7
- Get back data deleted, formatted & damaged due to various reasons
- Fast data scan & analysis and versatile file preview, search & filter

Ashampoo Burning Studio 2014



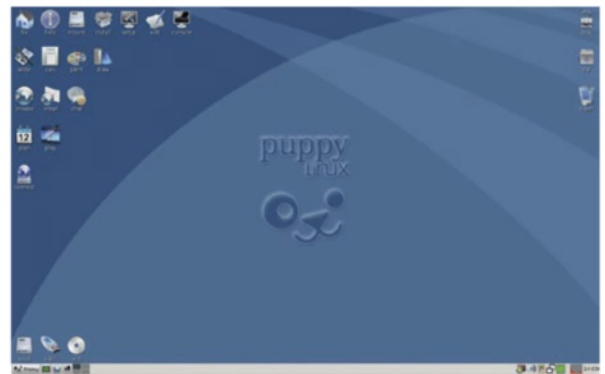
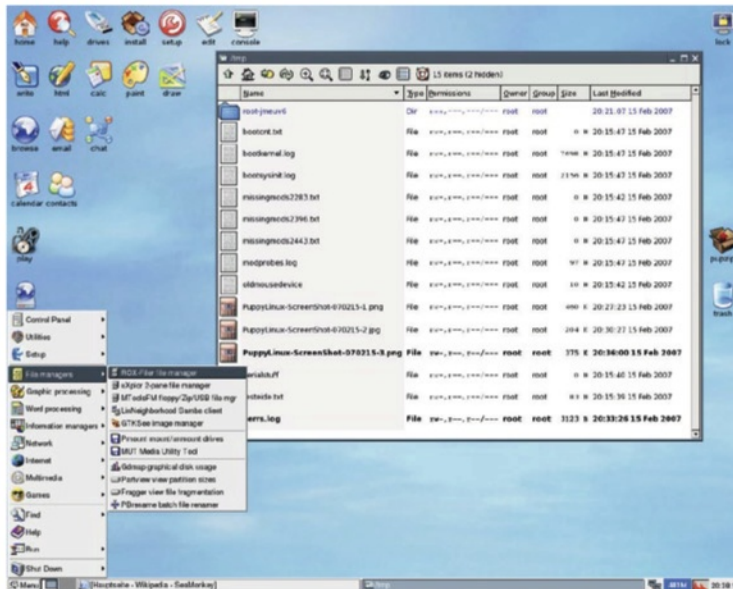
Ashampoo Burning Studio 14 is the result of over 14 years of experience in developing burning and multimedia software. Easier to use, more powerful and totally reliable – experience the best Burning Studio ever made!

- Burn your files, music, photos and videos to CD, DVD and Blu-ray disc
- Backup and protect sensitive data with file encryption
- Make perfect copies of your CDs, DVDs and Blu-ray discs
- Author and create movie and slideshow discs in HD quality
- Create audio discs and design your own booklets and covers
- Browse and create disc images

IObit Advanced SystemCare 7 PRO

Based on #1 ranked BitDefender antivirus technology and IObit anti-malware engine, Advanced SystemCare Ultimate 7 incorporates top anti-virus capabilities, as well as the already proven comprehensive PC tune-up ability. It provides protection against all kinds of security threats, system slowdown, freeze and crash without slowing down your system.

Advanced SystemCare Ultimate 7 is compatible with other security software, and it includes all features of ASC PRO. Users who uninstall Advanced SystemCare PRO



► Puppy Linux

Puppy Linux enables you to save money while doing more work, even allowing you to do magic by recovering data from destroyed PCs or by removing malware from Windows.

- With Puppy Linux, you can carry your programs and data anywhere.
- Easy – Just use a CD or USB flash to boot a PC. Puppy Linux is downloadable as ISO, an image that can be burned to CD or DVD.
- Fast – Because Puppy is small, it can live in your PC's memory and be ready to execute your commands quickly, whereas in other systems, programs are first read from drive storage before being executed.
- Save Money – Even if your PC has a broken hard disk, you can still boot Puppy via CD or USB and continue working. Old PCs that no longer work with new systems will still work good-as-new with Puppy.
- Do More – Puppy boots in less than a minute, even in older PCs, and

does not require antivirus software. Administering Puppy is quick and minimal. With Puppy, you just have to take care of your data, which you can easily save to USB flash (then forget about your operating system!). Your data can be read by other computers.

- Do Magic – Help friends suffering from computer malware by booting Puppy and removing malware from their PC (use antivirus that is built-in or can be installed in Puppy). Example – bad Autorun.inf is easily removed by Puppy (just delete it as well as its companion exe program). If your friend thinks that she has lost data from her corrupted hard disk, boot Puppy and try saving her data!
- Carry Anywhere (Portable) – Because Puppy is able to live in CD/DVD or USB flash, as well as save data to these same devices, you can carry your programs and data with you.

during Advanced SystemCare Ultimate 7 trial can easily revert to ASC PRO at any time.

Abelssoft CleverPrint 2014

Saves Money: Printing multiple pages on one is possible (1, 2, 4, 8). Unnecessary Pages can be excluded from the print job.

Cleans up: Documents in the print job can be ordered (by the most important page p.a.). You can also combine a print job from many different programs. For example mix a print job from Microsoft Word and Excel.

Optimises Print Jobs: CleverPrint can remove graphics from within a print job and thus drastically reduce printing costs

Saves Time: CleverPrint saves and manages letterheads and can print them on any document you want.

Watermarks: Watermarks, text or pictures can be inserted in foreground or background of the print job.

Saves printer cartridge: The new CleverPrint toner saving function allows to lighten up your print job before printing. This ensures a reduced consumption of the printer ink.



DVD CONTENTS

WINDOWS • 7Zip • CCleaner • CutePDF Writer • Deep Burner • Defraggler • Foxit Reader • Apple iTunes • Malwarebytes Anti-Malware • Open Office • Sandboxie • Songbird • Spybot Search & Destroy • Teracopy • VLC Media Player • WinRAR • WinZip • Avast Free Antivirus • AVG AntiVirus Free Edition 2011 • PC Tools AntiVirus Free **INTERNET** AOL Instant Messenger • Vuze • Google Chrome • Dropbox • Feed Reader • Filezilla • Internet Explorer • Microsoft Security Essentials • Mozilla Firefox • Mozilla Thunderbird • Skype • Steam • ZoneAlarm **DRIVERS** ATI • Nvidia • Direct X • Realtek Audio Codecs • VIA Hyperion Drivers **LINUX** Puppy Linux **FEATURE** CyberGhost 5 VPN • Leawo iOS Data Recovery • Ashampoo Burning Studio 2014 • IObit Advanced SystemCare 7 PRO • Abelssoft CleverPrint 2014 **EDITORIAL** Burning an ISO Image

INSTRUCTIONS: Open Windows Explorer, navigate to your DVD drive and double-click Index.html in the root directory. **DISC PROBLEMS:** To replace faulty DVDs, please send the discs to: PC&Tech Authority DVD Replacements, R50 Victoria St, McMahon's Point NSW 2060

Make sure to include your name and postal address on the back of the package so that we know where to send the replacements. For all other DVD related issues email cd@pcandtechauthority.com.au. As the delivery platform only, PC&TA and Haymarket Media cannot and will not provide support for any of the software or data contained on these discs. Although all discs are virus scanned, Haymarket Media cannot accept any responsibility for any loss, damage or disruption to your data or computer system that may occur while using the discs, the programs or the data on them. There are no explicit or implied warranties for any of the software products on the discs. Use of these discs is strictly at your own risk.

Input Output



DAN RUTTER BRINGS THE ANSWERS TO YOUR QUESTIONS LIKE NO-ONE ELSE CAN

AFTER A DRIVE, HE GIVES HIS CAR A RUBDOWN AND FEEDS IT SOME OATS

Is defragmenting a Solid State Drive always a bad idea?

My dad has one in his all-singing-all-dancing home PC now, and persists in running scheduled defrags of it once a week.

SSDs wear out when you write to them, right? Doesn't defragging write to the whole disk, so it wears the thing out as fast as anything ever could? Is there any possible reason to do this?

Matthew O'Farrell

OI'm hesitant to say that there's never any possible reason to defrag an SSD, because filesystems are pretty deep magic and there are some extremely perverse possible drive use cases.

SSDs also use "wear levelling" to spread write operations over the entire drive, so if you defrag a 50%-full SSD, moving most of the data on it, you'll not unduly damage something approaching half of the drive and leave the other half alone.

But the principal purpose of defragging a mechanical drive is to reduce its latency - the "seek speed", the time it takes to get the heads to the right location on the platters, and then the "rotational

latency", the time it takes for the right data to spin around under those heads. Modern defraggers also move frequently-used and associated data to the most quickly-accessed part of the platters.

All parts of an SSD's storage are as fast as each other, and even a slow SSD has random seek times of well under one millisecond. (That's about a tenth of the fastest mechanical drives, and about a twentieth of what many drives manage.)

So even if you ran a disk *fragmenter*, software specifically designed to split files into as many widely-separated parts as possible, the effect on system performance would probably not be noticeable.

Perhaps this magazine will convince your dad. I'm not putting any money on that, though.

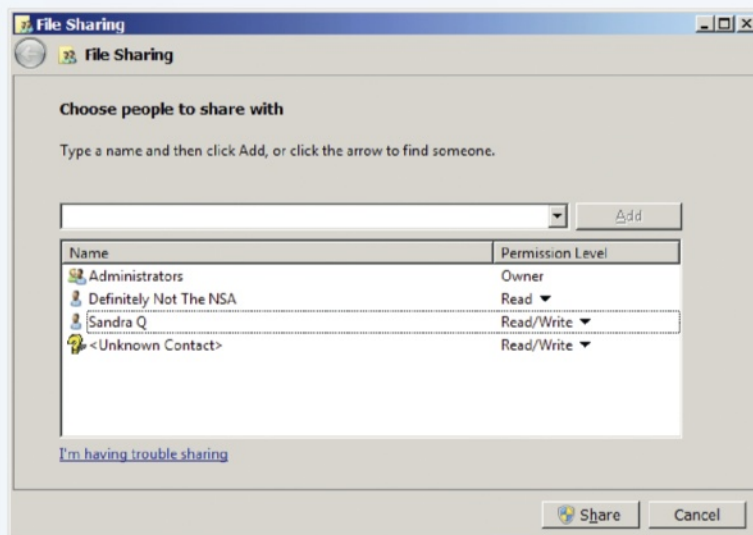
I'M NOT SAYING IT'S ALIENS, BUT...

IWhen I go to Sharing in the properties for a folder (Win7 64 bit), the list of people the folder can be shared with when I click "Share" includes "Administrators", my own account, and "Everyone", and "<Unknown Contact>".

That last one apparently has "Read/Write" access, by default. It doesn't appear in "Manage [user] Accounts".

What IS it?!

Sandra Q



OThere are a couple of ways this can happen, both involving previous Windows installs.

If you installed your current version of Windows on a computer that had some earlier Windows version on it, a user account from that previous Windows can appear as an "Unknown Contact" on the new one.

Also, if you've moved an NTFS-formatted *drive* from a previous computer to a new one, folders that were network-shared on the old one - which you're likely to be re-sharing on the new one - will have the Unknown Contact on their access permissions list, while other folders won't.

If you've managed to encounter a folder that only Unknown Contact is allowed to access, then you'll have to take ownership of it via Properties | Security | Advanced | Owner. This shouldn't happen, but given the apparently semi-random behaviour of Windows file sharing and permissions, I'd never say never.

Otherwise, you can safely delete the Unknown Contact from the access list right now, or ignore it.

AT LEAST IT DOESN'T RUN .EXES

When I use IrfanView to view images in a folder that contains MP3s, it insists on PLAYING those MP3s when it gets to them in the file order. I don't have IrfanView associated with those file types, so it doesn't open them if I double-click one, but I can't stop it playing them when it gets to one. Oh, and it opens PDFs too.

How do I stop this?!

Hamish Uther

OIn the IrfanView Properties | Settings interface, click the lyrically-named "Load only associated types while moving through directory" radio button.

◀ Don't be alarmed, citizen.

STRANGELY FASCINATING WEB SITES

I Sometimes, the Chrome browser starts locking up all of one CPU of my computer - I've got a hyperthreaded 4-core i7, so that means 12.5% utilisation in Task Manager. There doesn't seem to be any particular site that does this; if I've got a lot of tabs open, Chrome just sometimes decides that one page, or if I'm unlucky more than one, needs some really deep thought.

I can see in Task Manager or Process Explorer that this is happening, and if I quit the whole browser and re-run it to re-load all of the tabs then the problem may be solved. I also, however, notice that it often is one particular tab doing it, and when I close that tab the extra CPU usage goes away. But I only find this at random, because there's no way for me to see which tab has the problem in advance!

Is there a finer-grained task-monitor thing that will show me each tab's resource use?

Dave Small

O Yes there is, and it's built into Chrome. Just press shift-Escape to bring up Chrome's own inventively-titled Task Manager, which can monitor lots of different things, with CPU usage one of the default columns.

(It's more comprehensive than you probably need in a browser, but the control-Escape Task Manager comes into its own in Chrome OS.)

SELF-CENSORSHIP

I Certain Web sites give me an "unable to access the network" error in Chrome and analogous ones in other browsers. I just ran Internet Explorer and it says "Internet Explorer cannot display the webpage", with the connection-diagnosing thing saying "the device or resource (URL-of-site) is not responding", and Firefox says "The proxy server is refusing connections", "Firefox is configured to use a proxy server that is refusing connections", but I don't have a proxy server!

Or maybe I do, that'd be something that malware that wants to display its own special ads or whatever might do, right? Supporting evidence for the malware theory is that my phone, connected to the same home network as the computer, can see the Internet fine. And most Web sites work. But some don't.

I/O OF THE MONTH

YOU BOUNCED THE BITS LOOSE

I A couple of months ago I knocked over my 2Tb Seagate Expansion USB external hard drive. I had it standing vertically and elbowed it over onto the desk with a sickening thump. It seemed fine afterwards - I did an error scan and there were no problems. This morning, though, it's stone dead. Might as well not be plugged in at all, as far as the computer's concerned.

As you have said on many previous occasions, data you do not have backed up is data you do not particularly want. Imagine a crazy parallel universe in which there was data that I DID want on this drive. What chance do I have of recovering it, and how?

C. Seery

O A standard physically-small external hard drive will contain a 2.5-inch laptop drive, which is quite resistant to physical damage from falls. Larger external drives that are cheaper per gigabyte contain ordinary 3.5-inch desktop drives, though, and those are more vulnerable to drop damage.

I say this for the benefit of other readers,

though, not you, because if a fall's going to break a hard drive, it'll almost always break it immediately. Not even an hour later, let alone two months.

A large proportion - possibly a majority, actually - of external-drive failures are electronic, not mechanical. And, better news yet, they're usually not a failure of the hard drive's own electronics, but of either the drive box's power supply or its "bridge" hardware, which is what translates the hard drive's native ATA into USB or FireWire or whatever. (ESATA external drives don't have any bridge hardware to fail, though.)

So if you open the box and plug the drive inside into new bridge hardware, or just straight into a PC, you'll often be in business again.

The new bridge hardware can be in another external box, or it can be one of the super-cheap USB-to-PATA/SATA adapter cables that are all over eBay for a few bucks delivered. Note that the cheapest kits don't come with a power supply for the drive, but if the broken external box's PSU still works you can use that.



▲ Some hard-drive platters are made of glass. Try not to drop those ones.

Among the blocked sites are the City Council site for Penrith NSW, where I live (some other random NSW council sites are blocked too...), and also buchmann.ca, webcom.com, lawlink.nsw.gov.au, patft.uspto.gov and lightbulbs-direct.com.

What malware/other thing is this? I'm at my wits' end!

Olav Tuuri

O A bit of back-and-forth with Olav turned up the culprit: PeerBlock, a utility for blocking certain hacking attacks, and self-appointed copyright cops, and various other things. (Olav

actually installed PeerBlock after I mentioned it in this column a year ago - dansdata.com/io142.htm.)

The default PeerBlock setup is *extremely* paranoid, blocking connections with all sorts of blameless governmental and educational institutions just to make sure it also catches the maximum number of bad actors. And PeerBlock, by default, also blocks HTTP, which is to say normal Web-browsing, traffic along with everything else. The effect of this is a semi-random scattershot blocking of all sorts of useful Web sites.

Mobile first

TOM ARAH ARGUES THAT THE TIME HAS COME TO RETHINK HTML AUTHORIZING – FROM THE GROUND UP

HTML and the first web browser, WorldWideWeb, were famously developed on Tim Berners-Lee's NeXT computer. The NeXT was a high-end graphics workstation aimed at wysiwyg print designers, but what made the web so revolutionary was its core principle of "universal readership". This was achieved by authoring HTML based solely on the information content of each page, rather than its appearance. As such, the world's second web browser – developed by Leicester Polytechnic student Nicola Pellow under Berners-Lee's guidance – was "LMB", a Line Mode Browser designed to render a stream of text-only HTML one screen at a time on any internet-enabled device, including mouseless, teleprinter-style dumb terminals. You can see what this primitive web looked like via the recreation at <http://tinyurl.com/q8wf6dk>.

Browsing the platform-independent, universal web with LMB was of largely academic interest until Marc Andreessen, a student at the National Center for Supercomputing Applications at the University of Illinois, grasped the commercial potential of HTML as a publishing medium. By adding rudimentary support for graphics, layout, typography and eventually scriptability, and by aiming his Mosaic and Netscape browsers at the mainstream of mouse-driven Windows and Mac users, Andreessen kick-started the web we know today.

In those early years, trying to design web pages that worked across widely differing systems was a challenge. It boiled down to targeting the lowest popular software and hardware standards in terms of the browser's design capabilities and the user's screen resolution. This lowest common denominator slowly rose as browser support for CSS1-based typography and then CSS2-based layout became more widespread, while screen sizes and resolutions slowly increased to match. By 2010, designers could finally assume that 99% of site visitors would have reasonable CSS support and a display offering 1024 x 768 pixels or more. Twenty



years after Berners-Lee first created the web, all users were using NeXT-like systems.

At last web authors had a workable design platform, and they took full advantage of it. The new default approach to web design employed CSS positioning to create pages with a fixed width of between 900 and 1000 pixels, usually with side columns and a wider, central content column, and the whole page centred on the browser screen. This style spread, until nine of the top ten sites were using it – Google's cut-down fluid design being the sole exception. This practice soon hardened into a standard, with many designers taking the fact that 960 happens to be divisible by 2, 3, 4, 5, 6, 8, 10, 12 and 16, and thus is ideal for multicolumn grids, as a sign of divine approval. Moreover, as screen sizes continued to grow, this standard remained unchanged as wider page widths led to line lengths that were too long for comfortable reading. It looked as if web-page design had reached a natural plateau, and would remain fixed forever.

THE TABLET REVOLUTION

Forever didn't last very long. In April 2010, the iPad was launched, and with it the era of mobile handheld computing. Less than four years later, the way we think about personal computing has

been transformed. According to a 2013 Gartner report (<http://tinyurl.com/d3m8dx>), 116 million tablets were sold in 2012 – a new market almost a third as big as that for traditional desktops and laptops. During 2013, this is set to expand by another 70%; by 2017, Gartner expects annual tablet sales to have risen almost fourfold, and to comfortably outstrip traditional desktop devices.

So what does a web designer need to do to target this crucial new market? When tablets first appeared, the answer seemed beautifully simple: namely "nothing". After all, the first-generation iPad offered a powerful, standards-compliant browser and a 1024 x 768 display. Indeed, the iPad's promise of the "web in your hands" was the main driver of its phenomenal success. Resolution is only one part of the story, however: the other is screen size, and a fixed-width page designed for low-density desktop screens is too small for comfortable reading on smaller tablet screens. This wasn't a showstopper, since tablet users can always zoom in on the content column and pan when necessary, but it isn't ideal. Moreover, with the advent of Android-based competition, tablet form factors have diversified and shrunk, making the problem more acute.

Web designers are gradually coming to accept that the hard-won desktop



TOM ARAH

Set up his Edinburgh-based design company in 1987. As well as design work, he provides training and consultancy services

Image: Wikipedia



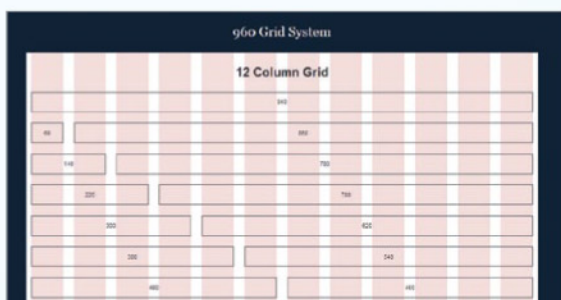
▲ How the web looked on LMB, the first platform-independent browser

design standard, based on fixed-pixel-width grids, isn't the firm foundation for the future that it once seemed. Instead, the solution is "responsive web design" (RWD). Ethan Marcotte coined the term in an article published only a month after the first iPad launch. The idea really took off the following year, when Google gave its support: "Google recommends webmasters follow the industry best practice of using responsive web design, namely serving the same HTML for all devices and using only CSS media queries to decide the rendering on each device."

So, how do you go about implementing RWD? The basic principles are straightforward enough. First, make your layout fully fluid by ensuring your CSS grid employs percentages rather than fixed pixel widths, so that it will automatically fill any sized screen. Second, make your content as fluid as your layout by specifying text sizes in ems and managing graphics through CSS – and in particular the "max width: 100%" property that permits bitmaps to scale up to their full pixel dimensions but no further. The third and defining ingredient is the use of CSS3 media queries that can alter the CSS styles employed based on the current browser width. Using these queries, you can add hand-tailored breakpoints, say to drop from three to two columns, and to change the size, position and display of content such as graphics and navigation.

Put this all together and, as you

“Trying to design web pages that worked across differing systems was a challenge”



▲ Web design became standardised around fixed-grid layouts optimised for desktop browsing

resize your browser on the desktop, you'll see responsively designed web layout and content adapt intelligently in real-time. On tablets, the crucial point is that whatever the size, pixel density and orientation of your device, your layout will look as though it was individually designed for the screen real estate available. The end result is a smoother, app-style feel to your website, with no need for awkward zooming and panning. As soon as you've seen RWD in action, it's clear that this is how web design should be handled in the new, multiscreen world.

THE SMARTPHONE REVOLUTION

Like most designers, I quickly grasped the beauty of RWD for retrofitting existing desktop designs for tablet-based browsers, but that was as far as I took it. However, it's important to realise that tablets are only part of the ongoing mobile revolution, as becomes apparent if you take a second look at that Gartner report. During 2012, total combined sales of desktop, laptop and tablet devices topped 450 million, but smartphone sales topped 675 million. This year, Gartner expects one billion smartphones to be sold, outselling desktops plus laptops and tablets by almost two to one.

But what do such sales statistics really tell us? Frankly, I was sceptical. For the web designer, what really matter are browser statistics, and they tell a different story. For example, the latest StatCounter figures put the total proportion of mobile browsing at less than 20%. This certainly isn't insignificant, but it means that traditional desktop browsers still account for the lion's share of more than 80%. More importantly, the "mobile" figures in this context include tablet browsing, and while it's difficult to find any definitive breakdown of the respective ratios, it seems clear that tablets account for the majority of handheld traffic (for example, an early statistic credited the iPad with just



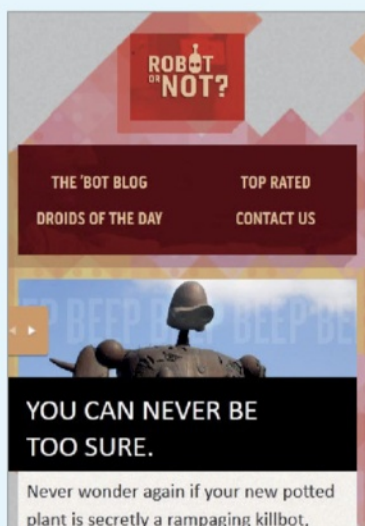
▲ Mobile browsing is still a minority – but the trend is clear

over 50% of the total, and the far more numerous iPhone with less than 20%). In short, although there must already be more than a billion smartphones in use, they account for only a fraction of total web traffic, and most of that will be from a few dedicated video-streaming sites rather than from general browsing.

This low phone-based traffic isn't surprising when you think about how smartphones are used. The main attraction of tablets has always been the web, but the main attraction of smartphones isn't their browser but their dedicated apps. Everyone with a smartphone knows how handy it is to be able to access opening times, phone numbers, prices or other essential information on demand while you're out and about, but such hit-and-run (and often pay-as-you-go) access is very different from traditional web browsing. The bottom line is that browsing on a smartphone is today's equivalent of browsing with LMB: an important, universal last resort, but few are going to do it for pleasure.

It's important not to get carried away by the hype, but over the past year I've come to view the relationship between smartphones and HTML in a far more positive light. To begin with, you only need to see a fully mobile-optimised site such as the BBC news site to realise that browsing on a smartphone doesn't have to be a joyless chore. Indeed, it turns out that the main reason the experience is so awkward is precisely because of the earlier development of the fixed-width desktop design standard, which means that mobile site visitors are forced to look onto a large magazine-style page through a tiny smartphone window. Once all sites have caught up with the new standard of touch-friendly RWD, smartphone surfing has the potential to become as natural and popular as it is on the desktop and tablet.

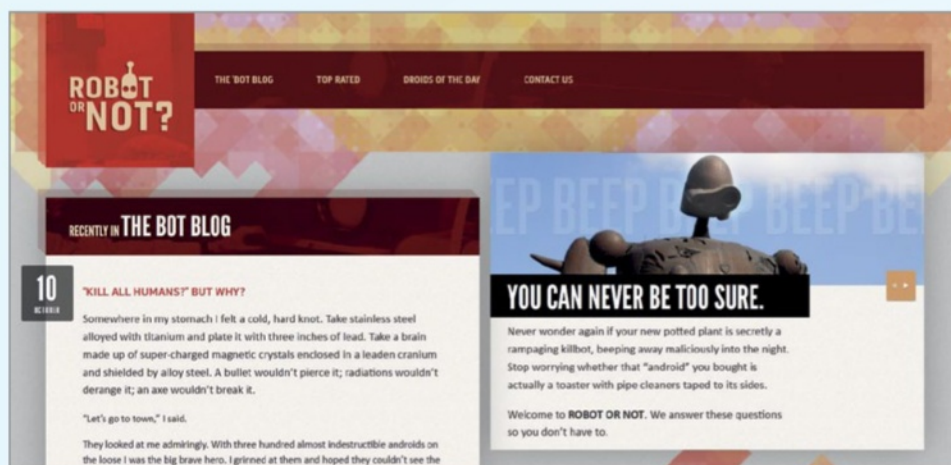
In fact, this process is already well under way. In February 2010, Google announced that it was now a "mobile-first" company, and in December 2011 launched a Googlebot dedicated to



trawling for smartphone-optimised content. The resulting higher ranking for mobile-friendly sites doesn't only boost the whole browsing experience for smartphone users, it also has major implications for content producers. The promise of more traffic and a brand-new audience is a huge incentive, but there's also a veiled threat: Google has made it clear that it considers RWD to be "industry best practice", and you really don't want Google thinking your site is an outdated, non-adaptive, desktop-only dinosaur.

Throw in technology-based advances such as voice-based search, the spread of 3G, 4G and Wi-Fi access, all-you-can-eat data allowances and the new big phone or "phablet" form factor, and I believe that we're fast approaching a tipping point. The most important factor of all is price, and here - thanks to the rise of Android - the combination of cutthroat competition and global economies of scale should see costs plummet and penetration explode.

Gartner predicts that by 2017 smartphone sales will be close to two billion, outselling tablets by almost



▲ Responsive web design ensures that page designs adapt to the screen real estate available – ideal for tablets of all shapes and sizes

four to one, and desktops and laptops by almost seven to one. Sooner rather than later, most people on the planet will be able to access the web in the palm of their hand. This coming together of so many long- and medium-term trends looks set to change the very nature of the web, putting truly universal access back at its heart and not just from any device, but from wherever you happen to be.

MOBILE FIRST

It's hard to argue with these tectonic shifts, but my personal conversion to mobile-first thinking came from a slightly different angle, and was far more immediate and practical - in fact, if you're a Dreamweaver CC user, it takes only a few minutes. First of all, you need to create a new site and then create a new page using Dreamweaver's Starter Templates, select the "jQuery Mobile (Local) sample page" option and save the result as index.html. Now type Ctrl+Alt+B to call up Dreamweaver's PhoneGap Build panel, and if you haven't already done so, sign up to the service (it's free as part of your CC subscription). Then hit Continue |

Create As New Project.

You'll need access to an Android phone, on which you've installed the free QR Droid app and changed the installation settings to enable installation from sources other than Google Play. Back in Dreamweaver, click on the "View QR Code" button in the Android row in the PhoneGap panel, and scan it with QR Droid to download and install the app. That's it - you've created your first native mobile app!

I plan to look at how to make the most of jQuery Mobile and RWD for both websites and apps in a future article, but it was this first experience that began my own conversion to mobile-first thinking. It made me realise that - even if smartphone browsing remains a minority interest - HTML can still deliver content to mobile users via apps. Indeed, by enabling the creation of cross-platform native apps that work on all mobile platforms - Android, iOS, webOS, BlackBerry and Windows Phone - and adaptively scale to fit all screens, universal HTML is the only route to reach the whole of the global smartphone audience, whether online or offline, whether in the browser or out of it.

With handheld, voice-enabled, touchscreen smartphone devices running HTML5-based browsers and apps, we've certainly come a long way since the days of dumb terminals, HTML1 and LMB. However, the real surprise is just how deep the roots of today's state of the art go: indeed, the advent of mobile-first authoring is the ultimate vindication of Berners-Lee's original insistence that HTML should focus on simplicity, adaptability and universal readership, and on ensuring that content remains fully accessible to any and all devices. That's the best foundation for today's desktop, tablet and smartphone, and for whatever else the future may bring. ■



Office Web Apps for everyone

JON HONEYBALL IS IMPRESSED BY UPGRADES TO OFFICE WEB APPS AND FUSION 6 PROFESSIONAL, AND FINDS HIMSELF IN THUNDERBOLT NO-MAN'S-LAND



The feature of the newly revised Office Web Apps that first caught my eye was simultaneous, multi-user editing of the same document. This ability has been seen as the holy grail for years, and it's genuinely difficult to achieve. Indeed, it's far easier for vendors to push their heads under the sand and shout, "La la la, I can't hear you" whenever they're asked if their software offers it.

Simultaneous editing raises multiple technical problems that need to be considered and resolved. Who owns the file? Where is it stored? How do you apply locks to it? Should everyone be granted read/write access, or should there be one author and additional readers? Which set of edits wins if two people change the same item at the same time? Also, what happens if changes are undone? Should users be able to undo changes made by others, or only their own? These are only a small portion of the issues that affect multi-user document editing, which is truly one of the most challenging

computing problems.

Attempts have been made in the past to make it work better, but were hampered by the problem of having multiple instances of the editing application running on computers that aren't talking to one another; communication is only happening through the file structure itself. Clearly, such an approach isn't viable.

However, if an application is running on a cloud server, it's possible to allow many people to have read/write access to the same data simultaneously. This is especially true when you remove the concept of "File | Save" from users, and allow documents to be automatically saved by the server whenever a change is made by a participant. The server can also maintain an undo stack for each user to allow interleaved edits to be unwound.

Google has supported multi-user editing for a while in its Google Apps, and we've used it successfully at *PC&TA* to co-ordinate teams for events. For example, when some of us meet up for CES in Las Vegas, we keep a Google

“Multi-user editing has been the holy grail for years – it’s genuinely difficult to achieve

spreadsheet that lists the various press events, their locations and who's going to cover what. Any of us can update it, and everyone can see the updates. Bringing similar functionality to Microsoft's Office tools is a big deal, if only because it had been significantly lagging in this area, and it's good to see the latest round of upgrades to Office Web Apps bring it up to scratch.

I'll confess that I'm pleasantly surprised by how good the Excel Web App has become. Of course, it's still a pale imitation of its big brother running on Windows-on-Intel, but I can happily accept its limitations because of the other features it brings to the party. I was quite surprised to see some power features in place; we use cell-entry data-validation rules a lot, to ensure that only one from a permitted range of values is entered into a cell. I wasn't expecting to find this kind of power in Excel Web Apps, but it's there. If Microsoft can keep pushing forwards with these apps, it won't be long before they're all good enough - most of the time.

FUSION 6 PROFESSIONAL

I really, really like VMware Fusion. I've been using it since it was first released, and I'll happily confess that I was drawn to it because of its interoperability with other VMware products; it meant I could build a VM on my desktop, then move it over to a server, or vice versa. I know many people prefer Parallels, but I'm stuck in a groove, and I'm happy staying there, so long as VMware keeps delivering the goods.

The recent release of Fusion 6 added a bunch of new capabilities, but many of these belong in the nice-to-have, rather than must-have, category: more speed, more scalability and so forth. I'm happy to have them, but they're not deal-breakers. However, I'd never looked at the Professional version of Fusion before - until it caught my eye.

I use snapshots a lot (some would say too much). A snapshot is a delta within a VM storage instance that's a set of differences between states, but perhaps an example will explain better. Let's say I have a Windows 7 VM set up

that I'm happy with. However, I want to try out a new beta product - let's call it Software X - so I take a snapshot, which creates a frozen "photocopy" of my working Windows 7 installation at that point in time. I then install Software X onto the VM, kick its tyres and decide whether it's good or bad. When I'm finished playing, I can roll back from the current session to my snapshot, so that everything I've done from the moment of taking that snapshot is forgotten - Software X simply ceases to exist. Essentially, using snapshots means I can always return to a known-good working state.

Alternatively, I could make a snapshot of the Software X installation, roll back to my base Windows 7 installation, do some work and decide to go forward again to the Software X installation. Equally, I could go back to my Windows 7 base and try out Software Y, thus creating a fork in the tree of instances. If I save a snapshot of Software Y, too, I can immediately switch between my original Windows 7 install, my Software X install and my Software Y install to compare their behaviour. The Software X and Y snapshots are both deltas from the original Windows 7 base starting point.

Simple, isn't it? Well, yes - except that things can become rather complicated and your tree can sprout many branches. If absolute performance isn't a problem, the flexibility this brings can be stunning - whenever I test software, for example, this is exactly the sort of thing I do.

But if I wanted more - if I decided that Software Y was a fabulous product, for example - I might want to put it into a self-contained VM, delete anything to do with Software X and roll up the Windows 7 base with the Software Y snapshot into a single new VM. With the Pro edition of Fusion, I can do this.

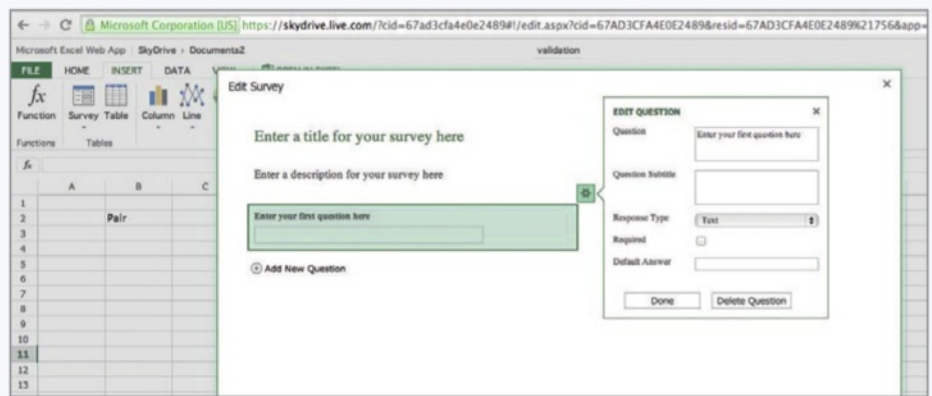
Right-click on a snapshot and choose Create Full Clone; this creates a new VM containing that snapshot and all the rollups to that point, but it becomes a standalone new copy. If you're feeling really clever, you can create something called a Linked Clone, which is like taking the snapshot into a new VM, but linking it back to the original base instance. All of this was possible in the past, but there was no user interface to make it easy.

Something else surprised me about Fusion 6 Professional. I wanted to make a VM of OS X 10.9 Mavericks, but I didn't expect it to be easy; Apple

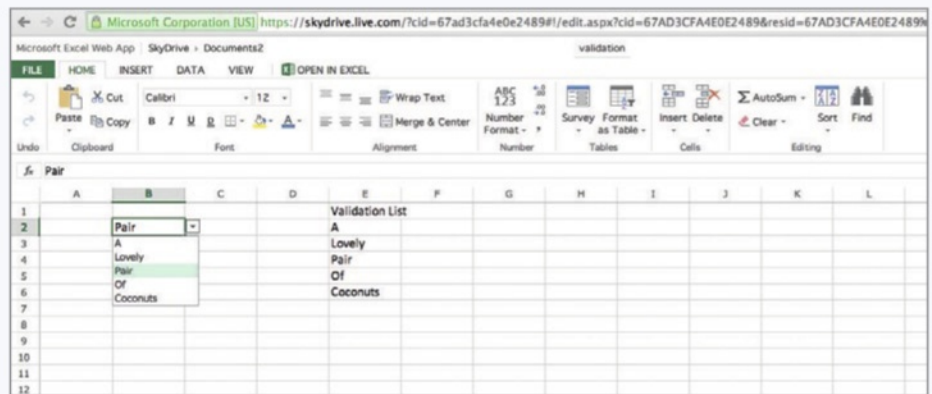


JON HONEYBALL

Computer journalist and consultant specialising in both client/server and office automation applications.



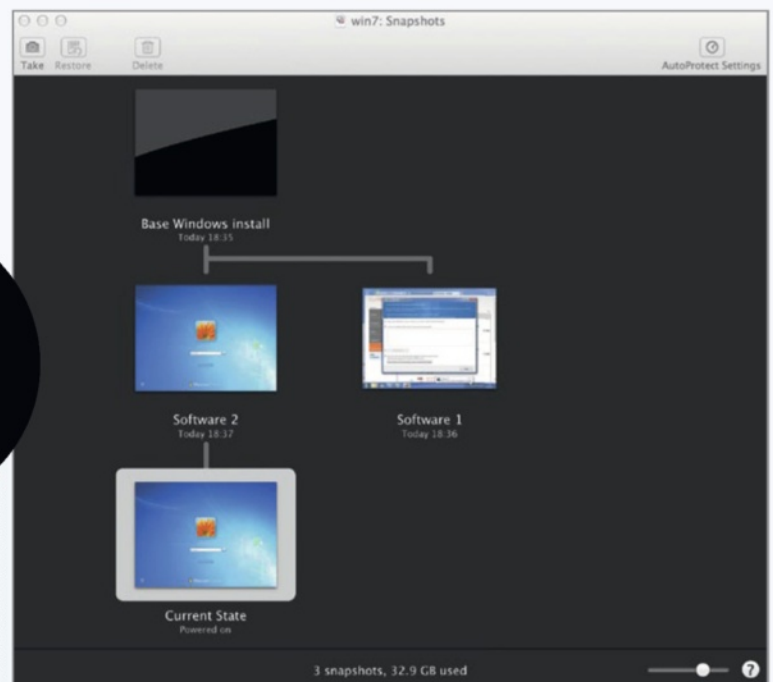
▲ Microsoft has added multi-user editing to Office Web Apps, and it works surprisingly well



▲ The improved Excel Web App offers tools I wasn't expecting, including data-validation rules

allows you to put OS X into a VM, provided everything is running on a Mac - you can't put it onto a PC running VMware under Windows, for example - but from where do you get an instance of Mavericks to boot into that VM?

Well, the solution to this problem has become very simple indeed, since Fusion 6 lets you boot a VM directly from the OS recovery partition on the machine. I created a new VM and selected the recovery partition boot option, and a few minutes later I had a



▲ VMware Fusion 6 Professional offers advanced snapshot capabilities



▲ Despite the success of touchscreens, pen mode still has its place

VM running Mavericks. It's been great for testing software that I don't want to put onto my workstation immediately, but which I still need to test.

Finally, I see from the specifications page for Fusion 6 that it will support huge VMs with up to 16 virtual processors, 8TB virtual disks and 64GB of memory for each virtual machine. Just right for my forthcoming Mac Pro, methinks.

PEN MODE IN OS X

Having installed OS X into a Fusion VM, I dropped into System Preferences on the installation running in the VM. What did I find? To my surprise, there was an extra icon for "Ink". Intrigued, I dug a little deeper and reminded myself that OS X actually has a full pen-and-ink handwriting-recognition system built into it.

Whether this is a relic from the past or something that's still under development at Apple is hard to tell: operating systems accrue all sorts of cruft over the years. Does anyone use the graphing tool in OS X, for example? It's been in there for years, but I know of no-one who's used it. Nevertheless, it was interesting to discover that pen support is still there, even though the world has moved down a different

track towards touch support (most notably on the iOS version of the operating system, and on Windows 8).

Pen still has its place, though. It's a precise tool, and - not surprisingly - one that's well suited to tasks that would have used a real pencil or brush, especially when pressure-sensitivity is a requirement. I can't imagine certain high-end activities, such as architectural CAD or pixel-level photo retouching, working efficiently in a touch-only world.

I'm not sure why this Fusion installation of Mavericks decided that it had a device that could support inking, but I'm tempted to get hold of a small pen tablet to add to my desktop, just to give it a whirl. I fear that my delight at using a large, multitouch touchpad is going to be hard to relinquish, although I did recently revert to using a mouse for editing in Final Cut Pro X - grabbing frame windows to resize a video is much easier with a mouse than it is with a trackpad.

THUNDERBOLT BRIDGE

Have you ever wondered what the Thunderbolt Bridge device that's listed among your network adapters actually is? It appeared with Mavericks, and it's a useful step up for those who are migrating from one machine to another, since it enables disk access from a booted machine's encrypted partition.

Some of you will know that you can boot up a Mac in what's called Target Disk Mode, which means that the computer boots from firmware and acts like a large hard disk. You can connect to it via Thunderbolt or USB from another Mac, then use the lovely Migration Assistant tool to suck everything out of the first Mac and push it onto a new computer. It's a great tool for when you need to get your life out of one Mac and into another. I wish I could boot up a Windows computer in the same way.

The problem arises if you've encrypted the hard disk. Encrypting the disk creates an extra layer of safety and security for your data, especially for a laptop that might be mislaid or stolen. No-one can recover the data held on that hard disk without the appropriate keys, and those are held in your online Apple account. But what happens when you boot such a machine into Target Disk Mode? There's no proper OS running, so it can't decrypt the contents of the hard disk - which is where Thunderbolt Bridge mode comes in.

It allows you to boot the device, get the operating system running (and

therefore access its hard disk), then connect to another computer via Thunderbolt to complete the data transfer. I'm a little nervous at the thought of two computers connected via Thunderbolt, given that it's effectively PCI Express. However, it clearly works - and it's the solution for times when you need to transfer a lot of data from one machine to another at high speed.

THUNDERBOLT FIBRE CABLES

I'm finding it frustratingly difficult to get hold of 10m and 30m fibre Thunderbolt cables so that I can move my disk arrays away from my desktop. Sometime soon, if the Gods look kindly upon me and Santa brings me a new Mac Pro, I want to be able to move everything off my desk except for the monitors, keyboard and trackpad.

A critical component of this project is the arrival of fibre-optic Thunderbolt cables from Corning. These were certified by Intel months ago, and I saw them in use at the NAB show in April in Las Vegas, with a promise that production was going to start "real soon now". Indeed the cables are now available in Apple's online store in the US - the 10m version is priced at \$US330 - but not here.

So, I visited a few online vendors in the US to see if they could supply it. Oh yes, said their website, the cables could be with me in a few weeks. Excitedly, I placed an order at one well-known vendor. Twenty-four hours later, I received an email to say the cable has been delayed and might arrive in February 2014. I cancelled the order.

Perhaps Apple is taking all the stock for itself? If so, it would be great if it let the rest of us order it, too. I see from the US Apple website that the cables are now "available to ship in 24 hours". Now, who do I know with a US credit card and postal address? ■

TEN-PORT USB 3

I have to tell you about a gadget that's proving hugely useful on my desktop. It's a ten-port USB 3 hub with a standard cable to plug in to a desktop Mac. Suddenly, I can plug in a phone for charging - or any other widget - without groping around for more ports. Alas, my mid-2011, 27in iMac doesn't have any USB 3 ports, but I can fix that with the Matrox DS1, which gives me a USB 3 port, two USB 2s and another Gigabit Ethernet port.



▲ Apple is selling Corning's 10m Thunderbolt cables - but only in the US

Wearables in the workplace

FIONA TEAKLE CONSIDERS HOW THE HOT TRENDS IN WEARABLE COMPUTING WILL EFFECT OUR JOBS

As recently seen at CES Las Vegas, wearable technology is moving ahead in leaps and bounds. Whether it's a smart watch, fitbit, heart rate monitor or any other connected device it seems the days of logging your exercise on a spreadsheet may soon be over. But even with the advances, are wearables ready for the workplace, or is the workplace ready for wearables?

One of the key market segments of wearable technology is the smart watch. In 2013 Samsung launched Galaxy Gear, which offered early adopters the chance to wear a camera as well as a reasonably funky looking piece of tech on their wrist. The downside with this was that it only worked with a particular Galaxy smartphone, although the promise of greater future compatibility did exist.

However despite their pedigree, Samsung were not the first to market with the modern smartwatch. While there had been iterations in the 1990's and early 2000's, last year saw the release of the kickstarter funded Pebble. As a caveat, the author owns a pebble (and loves it). The Pebble also though had its disadvantages. It had greater compatibility, but doesn't offer a colour display and does not (as yet) have a dedicated marketplace for apps.

Having used both devices, I can safely say that they do offer a significant benefit in the workplace, well, some workplaces. One of the key benefits is a return to some level of etiquette in meetings. We've all been in a situation where one person in a meeting is constantly glued to their phone, checking their facebook, twitter, linkedin, Instagram, yelp...you get the picture. Well, both Pebble and Galaxy Gear mean they are now simply glancing at their watch. Sure, they're still not actually listening, but at least they now give the appearance of listening.

On a serious note, working in media means I need to be aware

“

a benefit is the return to a level of politeness when in meetings.

”



FIONA TEAKLE is Director of the ACS Young IT Board. You can contact her at fionateakle@acsmail.net.au

of news quickly so I can develop a response and help develop opportunities for the ACS to weigh in on relevant issues. My smart watch means that I can now, at a glance, see my alerts and quickly triage them for action throughout my workday.

But it isn't just watches coming out of the wearable space. One of the most common pieces of wearable technology is the exercise tracking device. The two major options here are Jawbone Up and the Fitbit. Both of these devices work with your paired smartphone to provide valuable information on how much exercise you're doing, or not doing, and allow you to develop an analysis of such.

This isn't just tech for athletes or people working outdoors, but with an increasingly sedentary lifestyle becoming part and parcel of working in an office, these devices have an important role to play in promoting

health and fitness to a wide range of people who can benefit from being reminded to stand up and take a walk.

Finally, on a recent trip to Canada I managed to see, and trial, one of the most useful pieces of wearable tech I've ever seen - the Bluetooth glove. This is a specially made pair of gloves (worn for warmth in the cold Northern hemisphere) which contain a Bluetooth receiver, tiny battery, microphone and speaker. To receive a call, simply mimic holding a phone to your ear, with the thumb as your earphone and pinky finger as your mouthpiece. Will you look a bit odd? Almost certainly. Will you miss calls? Certainly not.

Ultimately, whether wearable tech makes a difference in the workplace depends on how well we can integrate it with our current roles, and a great deal of that will rely on collaboration between ICT professionals, manufacturers and the market. ■

MARKET PLACE

YOUR GUIDE TO DEALS AND PRODUCTS ADVERTISED IN THIS ISSUE

ADVERTISERS LIST

TP Link	2
Asrock	4
Corsair	11
ASUS	14 & 15
Fujitsu	17
West Coast Labs	33
APC	50
Monash	55
Trend Micro	65
Thermaltake	71
Draytek	110
Lindy	111
Corpssoft	112 & 113

Welcome to the *PC & Tech Authority* marketplace, packed with hardware and software deals to suit any budget. From PC components through to peripherals and even fully-assembled power machines, we've got a wide variety of products featured in the next few pages.

2



11



OBC



115



TOP DEALS

Do be sure to have a look at some of the great offers over the next few pages. And pay special attention to our wonderful iPad app. If you have one, this is one of the best ways to enjoy our magazine!



DrayTek
Aust & NZ
www.draytek.com.au

Surf with Confidence

Fast, Safe, Reliable, NBN Ready

DrayTek Vigor2860n-Plus

Triple-WAN NBN Ready VDSL2 / ADSL2+ Router with Concurrent Dual Band WLAN



- Triple WAN router with Fail-Over and Load Balance for reliable Internet access and flexibility; VDSL2/ADSL2+, 3/4G mobile USB, Gigabit Ethernet WAN ports for diversified Internet access.
- IEEE 802.11n WLAN AP with concurrent 2.4/5 GHz Dual Band
- 6 x Gigabit LAN ports for high speed network connectivity.
- Multiple VLAN (802.1Q), Port or IP based, for easily separating departmental or workgroup networks.
- 50k NAT sessions and IPv6 for NBN readiness.
- 2 x USB ports for 3/4G mobile WAN, FTP and printer server.
- 32 x VPN tunnels with hardware accelerator, comprehensive protocols for easy interoffice communication.
- 16 x SSL VPNs and VPN Trunk (Load Balance / Fail-Over).
- Object based SPI Firewall with DoS/DDoS defence, Web Content Filter, Content Security Management, etc. for maximum network security.
- TR-069 (VigorACS SI) remote management system, Smart Monitor, QoS and management tools for simplifying administrator's tasks.

DrayTek Vigor2860



Triple WAN Router with VDSL2/ADSL2+, Gigabit, and 3G/4G USB WAN port for Load Balancing and Fail-over, 6 x Giga LANs, SPI Firewall, CSM, 32 x VPNs, 16 x SSL VPNs, IPv6, VLAN, QoS, and support Smart Monitor (30 nodes) & VigorACS SI

DrayTek Vigor2860n



Triple WAN Router with VDSL2/ADSL2+, Gigabit, and 3G/4G USB WAN port for Load Balancing and Fail-over, 6 x Giga LANs, SPI Firewall, CSM, 32 x VPNs, 16 x SSL VPNs, 802.11n WLAN, IPv6, VLAN, QoS, and support Smart Monitor (30 nodes) & VigorACS SI

www.LINDY.com.au**LINDY®**
CONNECTION PERFECTION• **OVERNIGHT DELIVERY AUSTRALIA-WIDE** • **FREE TECHNICAL SUPPORT** • **GUARANTEED QUALITY**

HDMI to VGA & Audio Adapter

Connect your HDMI equipment to a VGA display or projector, with audio

- Converts HDMI signals to VGA & Audio
- Supports resolutions up to 1080p
- Supports 8/10/12 bit colour depths
- Supports YCC to RGB and RGB to YCC colour space conversion
- Powered via HDMI port

Our new HDMI to VGA & Audio adapter is a great value solution for connecting HDMI equipment to older VGA displays and projectors. Designed for use with Laptops, Ultrabooks, Tablets and Smartphones, this adapter is capable of resolutions up to 1080p and delivers analogue stereo audio via a 3.5mm socket.



HDMI to VGA & Audio Adapter	38 195	\$49.00
-----------------------------	--------	---------

HDMI to VGA Adapters

Convert HDMI, Mini HDMI and Micro HDMI to VGA analogue



- Converts HDMI signals to VGA & Audio
- Available with HDMI, Mini HDMI and Micro HDMI input connector
- Supports resolutions up to 1080p
- Supports 8/10/12 bit colour depths
- Supports YCC to RGB and RGB to YCC colour space conversion
- Powered via HDMI port

HDMI to VGA Adapter	38 191	\$39.00
Mini HDMI to VGA Adapter	38 192	\$39.00
Micro HDMI to VGA Adapter	38 193	\$39.00

HDMI Audio Extractor

Extract both analogue and digital audio from your HDMI signal

This very useful device extracts analogue and digital audio from a HDMI signal so it can be sent to your external surround sound speakers or amp. Perfect for home cinema and professional AV setups with HDMI equipment and devices.

- Supports HDTV resolutions up to 1080p
- Input: HDMI Type A
- Output: HDMI Type A, 3.5mm stereo, SPDIF (Optical & Coaxial)
- HDMI sample rate: 192kHz
- Optical sample rate: 48kHz
- Supports High Bit Rate (HBR)
- Optical audio supports: PCM2, Dolby 5.1, DTS 5.1
- Analogue audio supports: LPCM2



HDMI Audio Extractor	38 091	\$99.00
----------------------	--------	---------

CROMO High Speed HDMI Cables

Superior quality HDMI cable with Ethernet

- 24K gold plated contacts with stylish chrome plated connector hoods, fully shielded cable and additional strain relief
- 1080p 3D over HDMI ready
- Ethernet support allows IP devices to connect to the internet via a compatible HDTV
- Supports resolutions up to 4 x higher than 1080p
- Fully HDMI 1.4, HDCP HEC, ARC and CEC compliant
- Deep colour, x.v.Color and xvYCC compatible
- HDMI ATC (Authorised Test Centre) certified

**HDMI®**

0.5m	41 400	\$18.95
1m	41 401	\$21.95
2m	41 402	\$25.95
3m	41 403	\$33.95
5m	41 404	\$49.95
7.5m	41 405	\$79.95
10m	41 406	\$99.95

Australia's Leading Supplier of AV and IT Cables and Accessories**LINDY®**
CONNECTION PERFECTION**T: 1300 888 095 W: www.lindy.com.au E: techsales@lindy.com.au**

CORPSOFT.com.au

Free Delivery
on purchases over \$200 and under 3kg cubic weight

1300 SOFTWARE

Your One-Stop Software Shop
SINCE 1987

Order Hotline: 1300 763 892

2014 NEW RELEASES 2014

**Windows XP SP3
and Office 2003**

Support ends 8th April

Support included security updates to help protect your computer from harmful viruses, spyware and malicious software

**UPGRADE NOW TO WINDOWS 7
OR WINDOWS 8**

WINDOWS

Microsoft
**Windows 7
Professional
Upgrade**
Retail Pack
\$305

Microsoft
**Windows 7
Professional
System Builder**
Bonus 1TB Hard Drive
Retail Pack
\$295

Microsoft
**Windows 8.1
Standard**
Retail Pack
\$135
Save 10%

Microsoft
**Windows 8
Pro Upgrade**
**FREE UPGRADE to
Windows 8.1 Pro**
Retail Pack
\$189
Save \$210
off RRP

**Roxio Creator
NXT2**
Retail Pack
\$84
Save \$45

**Hallmark
Card Studio
Deluxe
2014**
Retail Pack
\$89

Microsoft
**Visual Studio
Professional
2013**
Retail Pack
\$833

**WD Black2
Dual Drive**
2.5 120 GB SSD
+ 1 TB HDD Kit
Retail Pack
\$440

**NEW
Adobe® Photoshop® Elements 12 &
Adobe Premiere® Elements 12**

Easy and powerful editing
for sensational photos and
videos. Now, share anywhere
for Win/Mac

**Photoshop
Elements 12**
Retail Pack
\$135
Download
\$115

**Premiere
Elements 12**
Retail Pack
\$135
Download
\$99

**Photoshop &
Premiere
Elements 12
BUNDLE**
Retail Pack
\$189
Download
\$175

**Pinnacle
Studio 17 Plus**
Your life in movies
enhanced
Retail Pack
\$Call

Acronis
**True Image
2014**
1-User
\$64
3-User
\$109

Corel
**Paint Shop
Pro X6**
Pro
\$88
Ultimate
\$110

Corel
**Photo Video
Suite X6**
Retail Pack
\$169
Save \$80

**WINDOWS
SOFTWARE**

Acronis True Image 2014 Premium	\$110
Adobe Acrobat XI Professional Upgrade	\$289
Adobe Acrobat XI Standard Upgrade	\$195
Adobe Acrobat XI Pro. Student & Teacher	\$97
Adobe CS6 InDesign Download	\$238
Adobe Creative Cloud 1 Year Sub	\$660
Adobe CS6 Dreamweaver Download	\$565
Adobe CS6 Design Standard Download	\$1785
Adobe CS6 InDesign Download	\$995
AutoCAD LT 2014	\$1799
CorelDRAW X6 Home & Student 3-User	\$180
CorelDRAW X6	\$449
Corel VideoStudio Pro X6	\$90
Corel VideoStudio Ultimate X6	\$110
Corel WordPerfect Office X6 H&S 3-User	\$189
Crystal Reports 2011 Upgrade	\$385
Crystal Reports 2011	\$685

CyberLink PowerDVD 13 Pro	\$77
CyberLink Power Director 12 Ultra	\$119
CyberLink Power Director 12 Ultimate	\$135
CyberLink Power Director 12 Ultimate Suite	\$229
Dragon Naturally Speaking Home 12	\$75
Dragon Naturally Speaking Premium 12	\$145
Dragon Naturally Speaking Pro V12	\$529
Encyclopedia Britannica Ultimate 2014	\$66
MS Office 2010 Home & Student 3PC	\$225
MS Office 2011 MAC Home & Student	\$148
MS Office 2011 MAC Home & Business	\$279
MS Visual Studio 2013 Pro	\$833
MS Visual Studio 2013 Pro with MSDN	\$1999
MS Windows 8.1 Pro - Full Version	\$318
MS Windows 8.1 Pro Pack (Upg Std to Pro)	\$209
MYOB AccountRight Standard	\$419
MYOB AccountRight Plus	\$699
Reckon QuickBooks Accounting 2013	\$378
Roxio Creator NXT2	\$84
Roxio Easy VHS to DVD 3 Plus	\$75
Trend Micro Max Security 2014, 3 User/DL	\$75

**CLEARANCE
CORNER...**

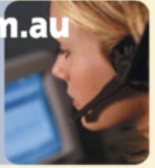
MS Picture-It!	\$11
MS Greetings Workshop Deluxe v2	\$15
Logitech C210 Webcam	\$15
Trend Micro Smart Surfing for MAC	\$15
Corel Digital Studio 2010	\$25
MS Office XP Standard Upgrade	\$49
MS Publisher 2002 Upgrade	\$55
Corel VideoStudio Pro X4 inc 3D Glasses	\$59
CorelDRAW v8	\$75
Family Tree Maker 2012 Platinum	\$85
Logitech K800 Cordless Backlit Keyboard	\$92
MS FrontPage +Free MS Publisher 2002	\$129
MS Windows 7 Home Premium Upgrade	\$195
Logitech Harmony 1100i Remote Control	\$265
MS Windows 7 Professional Upgrade	\$305
Adobe CS5.5 Design Premium	\$1495

Visit www.corpssoft.com.au for more specials

CORPSOFT.com.au

1300 SOFTWARE

Online: www.corpssoft.com.au
TollFree: 1300 763 892
Phone: (02) 9725 3700
Fax: (02) 9604 1983



Download Store • No Packaging • No Shipping • No Waiting

Reduce your environmental footprint, no shipping or packaging. **Step1:** Download. **Step2:** Purchase. **Step3:** Register and Activate.



Office 2013 Home & Student

Download **\$135**

Office 2013 Home & Business

Download **\$245**

Office 2013 Professional

Download **\$495**

Also available with DVD

Microsoft
Office 365 Home Premium
5 PCs or Macs
1-Year subscription
for 1 household



Plus BONUS \$25 Visa Gift Card Offer
when you buy Office 365 Home Premium or renew your subscription

Download **\$108**



Download **\$139**



Download **\$139**



Download **\$98**

Microsoft
Office 365 University
2 PCs or Macs
4-Year subscription
for 1 user

Microsoft Volume Licensing
Call us or visit our web for all your licensing requirements



Outlook 2010
\$199
+ FREE upgrade to 2013



Publisher 2010
\$269
+ FREE upgrade to 2013



Project 2010
\$957
+ FREE upgrade to 2013

Adobe CS6 Creative Suite

Student & Teacher Upgrade from

Design Standard	\$317	\$400
Design & Web Premium	\$382	\$560
Master Collection	\$567	\$789
Photoshop CS6	\$188	\$325

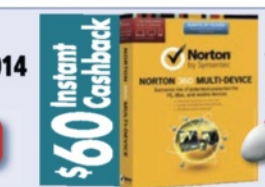
Creative Cloud

Adobe Creative Cloud Team Win/Mac [12 Month Membership] for existing CS3-CS6 Users

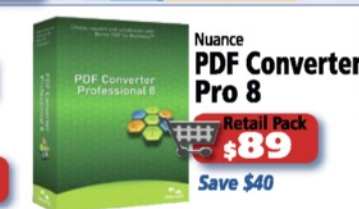
Lets you download and install all Adobe Creative Suite 6 applications, access online services for file sharing, collaboration, and publishing, and benefit from new apps and features as soon as available



Available Now.
See your images in a whole new light



Covers up to 5 devices of any operating system combination



JON HONEYBALL is sick and tired of roaming charges, and he's not going to take it any more.

“The life of an international business traveller isn't a happy one. Six-star hotels, executive lounges at airports, catnapping on the go-flat seat in Club Class; it's terribly tough. And here I am, writing this in the foyer of a hotel in Rio de Janeiro where I've been working all week. I could cross the road, go through the palm trees and onto the pure sand and thence into the water, but all is not well in this idyllic world.

Here in Rio, every hotel and bar has free Wi-Fi. So far, so good. There's usually a password, but this is provided. (My hotel uses the room number as both username and password to the Wi-Fi, and then curiously limits you to two devices. I hope my neighbours on the eighth floor don't mind me borrowing their logins. Well, it wasn't difficult to crack, was it?)

The real hassle of travel comes when you're out of range of accessible Wi-Fi. When I turned on data roaming on my phone, I received a text from my provider offering me a package of mobile data access – at \$50 for 10MB, or \$195 for 50MB. I very nearly choked on my mojito.

Roaming is expensive everywhere, of course. When I go to the States, I don't mess around with roaming, but instead drop into a T-Mobile shop and buy a local pay-as-you-go SIM. The last time I was there, I splashed out around 50 bucks for a SIM that let me make unlimited USA phone calls and consume unlimited 4G data for a whole month.

Unfortunately, depending on where you are in the world, it's not always possible to get your hands on a suitable SIM – especially if your phone, like most contract handsets, is locked to your

home carrier. Thus the telcos get away with sky-high roaming charges that bear no relation to the cost of the service offered, in the knowledge that, for most customers, going elsewhere is somewhere between inconvenient and impossible. It's a monopoly, and we need someone to break it.

The key is getting away from the GSM requirement for every phone to use a physical SIM. The next move has

“The telcos get away with sky-high roaming charges that bear no relation to the cost of the service offered”

to be soft SIMs – digital certificates providing the same authentication as a physical card, which can be provisioned on the fly and delivered electronically. You could keep a wallet full of virtual SIMs on your phone, and automatically switch between them as you travelled.

Now, who's going to do this? It requires a manufacturer that makes phones. A company with a global billing system, and a software provisioning system in place. A business large enough to take on the role of a fully global mobile operator, provisioning its own SIMs as required. It sounds like a job for Apple.

There's one fly in the ointment. Apple is in bed with the telcos, and you can bet they'll do whatever they can to prevent soft SIMs from becoming a reality. Once you can buy five days of SIM on the fly, the roaming-data scam immediately falls apart.

So far, though, Apple has had the

upper hand in the relationship. You want to sell Apple's latest shiny toy? No problem: here's a contract that locks you into financial penalties if you don't step up to the mark (if the rumours are true).

Right now, Apple needs to come up with something new to shore up its platform. The 5c hasn't been selling well, and iOS is no longer as indispensable as it once was. I've been carrying a new Nexus 5 with me all week alongside my 5s, and honestly, I could have managed just fine without the iPhone. Not that it has to be a Nexus 5; a Samsung Galaxy Note 3 or S4 would have done, or almost anything out there except Windows Phone, which I still find frustrating, annoying and limiting for my needs.

If Apple wants to maintain its high price points and incredible margins, soft SIMs are just the sort of disruptive technology that could do it. Anyone who travels would grab an iPhone without even looking at the alternatives. Then again, if the British Airways lounges I frequent are anything to go by, most travellers do already. It's Apple phones by the truckload, with a few Android handsets, mostly Samsung, along the way. Windows Phone? Well, there were four on the table next to me at the Heathrow Terminal 5 lounge on my trip out. But, if the overheard conversation was anything to go by, their owners all worked for Nokia. So that hardly counts.

Of course, Microsoft could do this, too. There's no reason why not. But it simply doesn't have the balls to try it. Make me the new Microsoft CEO, and watch me take the telcos down from their monopolistic perches. ”



Level 6, Building A, 207 Pacific Highway,
St Leonards NSW 2065
Locked Bag 5555 St Leonards NSW 2065 © 2014
Chief Executive Officer David Gardiner
Commercial Director Bruce Duncan

This magazine is published by nextmedia Pty Ltd ACN: 128 805 970, Level 6, Building A, 207 Pacific Highway, St Leonards NSW 2065 © 2014. All rights reserved. No part of this magazine may be reproduced, in whole or in part, without the prior permission of the publisher. Printed by Webstar Sydney, distributed in Australia by Network Services. The publisher will not accept responsibility or any liability for the correctness of information or opinions expressed in the publication. All material submitted is at the owner's risk and, while every care will be taken nextmedia does not accept liability for loss or damage.

Privacy Policy

We value the integrity of your personal information. If you provide personal information through your participation in any competitions, surveys or offers featured in this issue of Inside Sport, this will be used

to provide the products or services that you have requested and to improve the content of our magazines. Your details may be provided to third parties who assist us in this purpose. In the event of organisations providing prizes or offers to our readers, we may pass your details on to them. From time to time, we may use the information you provide us to inform you of other products, services and events our company has to offer. We may also give your information to other organisations which may use it to inform you about their products, services and events, unless you tell us not to do so. You are welcome to access the information that we hold about you by getting in touch with our privacy officer, who can be contacted at nextmedia, Locked Bag 5555, St Leonards, NSW 2065

PERMISSIONS & REPRINTS: Material in PC & Tech Authority may not be reproduced in any form without the written consent of the Commercial Director of nextmedia. Editorial items appearing in PC & Tech Authority originally published by Dennis Publishing remain the copyright and property of Dennis Publishing. Copyright Felsen 1994. All rights reserved.

EDITORIAL

Managing Editor: David Hollingworth:
dhollingworth@haymarketmedia.com.au
Editor: John Gillooly:
jgillooly@pcauthority.com.au
Art Director: David West

REGULAR CONTRIBUTORS

Rosalyn Page, Jon Honeyball, David Fearon, David Bayon, Barry Collins, Sasha Muller, Tim Danton, Tom Arah, Ian Wrigley, Simon Brock, Jonathan Bray, Bran MacEachaidh, Dan Rutter, Campbell Simpson

Production Co-ordinator: Ellen de Vries

Production Manager: Allison Begg

Circulation Director: Carole Jones

Printed by: Webstar

Distributed by: Network Services Company, Australia; Netlink, NZ

ADVERTISING

Phone: (02) 8399 7603 **Fax:** (02) 8399 3622

Group Advertising Manager:

Joanne Nichols: jnichols@pcauthority.com.au

SUBSCRIPTIONS

1300 610 765

or subs@pcauthority.com.au

nextmedia

CIRCULATION:
April 2013 - June 2013: 15,175



PRODUCTION

Printed on paper sustainably sourced
from PEFC certified forests



Please recycle
this magazine

Pioneer of Innovative Technology

DreamBook W84 Ultrabook

From \$799
RRP Inc-GST

- Intel Haswell Chipset
- Multi-touch Screen
- 1x HDD
1x mSATA



- Intel® 4th Generation Processor
- Up to 16GB DDR3 Memory
- 14.0" Full HD (1920x1080; 16:9) Multi-touch Screen
- Intel® HD Graphics 4600 Up to 1.7GB; Microsoft DirectX® 11
- 1x SATA HDD; 1x mSATA
- 2.0MP HD Video Camera; HD Audio

DreamBook Style W54

From \$499
RRP Inc-GST

- Intel Haswell Chipset
- Intel HD Graphics 4600
- 2.0MP HD Video Camera



- Intel® 4th Generation Processor
- Up to 16GB DDR3 Memory
- 14.0" HD (1366x768; 16:9) Crystal Bright Screen
- Intel® HD Graphics 4600 Up to 1.7GB; Microsoft DirectX® 11
- 1x SATA Hard Drive
- 2.0MP HD Video Camera; HD Audio

DreamBook Style W65

From \$549
RRP Inc-GST

- Intel Haswell Chipset
- Intel HD Graphics 4600
- 2.0MP HD Video Camera



- Intel® 4th Generation Processor
- Up to 16GB DDR3 Memory
- 15.6" HD (1366x768; 16:9) Crystal Bright Screen
- Intel® HD Graphics 4600 Up to 1.7GB; Microsoft DirectX® 11
- 1x SATA Hard Drive
- 2.0MP HD Video Camera; HD Audio

DreamBook Power W35

From \$1,199
RRP Inc-GST

- Intel Haswell Chipset
- Intel HD Graphics 4600
- 1x HDD
1x mSATA



- Intel® 4th Generation Processor
- Up to 16GB DDR3 Memory
- 17.3" HD+ (1600x900; 16:9) Crystal Bright Screen
- Intel® HD Graphics 4600 Up to 1.7GB; Microsoft DirectX® 11
- 1x SATA HDD; 1x mSATA
- 2.0MP HD Video Camera; HD Audio

DreamBook Power P15HW

From \$1,999
RRP Inc-GST

- Intel Haswell Chipset
- nVidia GeForce GTX 765M
- 2x HDD
2x mSATA



- Intel® 4th Generation Processor
- Up to 32GB DDR3L Memory
- 15.6" Full HD (1920x1080; 16:9) Crystal Bright Screen
- nVidia GeForce GTX 765M 2GB/770M 3GB/780M 4GB GDDR5
- 2x SATA HDD; 2x mSATA; Raid 0/1 Support
- 2.0MP FHD Video Camera; HD Audio

DreamBook Power W67

From \$649
RRP Inc-GST

- Intel Haswell Chipset
- Intel HD Graphics 4600
- 1x HDD
1x mSATA



- Intel® 4th Generation Processor
- Up to 16GB DDR3 Memory
- 17.3" HD+ (1600x900; 16:9) Crystal Bright Screen
- Intel® HD Graphics 4600 Up to 1.7GB; Microsoft DirectX® 11
- 1x SATA HDD; 1x mSATA
- 2.0MP HD Video Camera; HD Audio

DreamBook Power W37

From \$1,299
RRP Inc-GST

- Intel Haswell Chipset
- nVidia GeForce GTX 765M
- 2x HDD
1x mSATA



- Intel® 4th Generation Processor
- Up to 32GB DDR3L Memory
- 17.3" Full HD (1920x1080; 16:9) Crystal Bright Screen
- nVidia GeForce GTX 765M 2GB GDDR5 Graphics
- 2x SATA HDD; 1x mSATA; Raid 0/1 Support
- 2.0MP HD Video Camera; HD Audio

DreamBook Power P17HW

From \$2,199
RRP Inc-GST

- Intel Haswell Chipset
- nVidia GeForce GTX 780M
- 2x HDD
2x mSATA



- Intel® 4th Generation Processor
- Up to 32GB DDR3L Memory
- 17.3" Full HD (1920x1080; 16:9) Crystal Bright Screen
- nVidia GeForce GTX 765M 2GB/770M 3GB/780M 4GB GDDR5
- 2x SATA HDD; 2x mSATA; Raid 0/1 Support
- 2.0MP FHD Video Camera; HD Audio

DreamBook Power P37HW

From \$2,899
RRP Inc-GST

- Intel Haswell Chipset
- nVidia GeForce GTX 780M
- 2x HDD
2x mSATA



- Intel® 4th Generation EXTREME Processor
- Up to 32GB DDR3L Memory
- 17.3" Full HD (1920x1080; 16:9) Crystal Bright Screen
- nVidia GeForce GTX 765M 2GB/780M 4GB GDDR5 SLI
- 2x mSATA; 2x SATA HDD; RAID 0/1 Support
- Dual Camera 5.0MP/1.0MP HD Video Camera

All prices include GST, exclude freight, all images are for illustrative purposes only. Errors and omissions excepted. Free 1 Year On-site Pickup & Return Warranty, 2 and 3 Years Optional.

• ISO 9001 Quality Endorsed Company QEC11489 • Commonwealth Government Endorsed Supplier 263 • State, Local, Government, Education Contract Supplier

PIONEER COMPUTERS

Build your own dream!
www.pioneer.net.au
1300 883 218 / sales@pioneer.net.au

Unit 2,37 O'Riordan St, Alexandria NSW 2015 Australia
NSW: (02) 9690 2888 Q.L.D. (017) 3257 3879 VIC: (03) 8790 1830 NZ: (048) 377 0497 Fax: (02) 9690 0333

Dreamcare.com.au

New online service and support
for all brands of PCs, Notebooks
and Servers.

More than just antivirus

Did you know that every year, cybercriminals launch **65 million new attacks** designed to steal your private, personal information. This amounts to two new threats being created every second!

In Australia:

Over 50%

Of people don't check their Facebook privacy settings in a year

1 in 5

People have had their bank account or credit card details stolen

1 in 5

People have posted something online that they have regretted

Trend Micro **blocks over 250 million threats per day** with over 1,300 security experts working on surveillance and prevention.



Protects your Privacy on Facebook, Twitter and Google+



Guards against Identity Theft



Secure Online Banking & Shopping