

 **FIX YOUR SYSTEM**
SOLVE PROBLEMS AND GET
YOUR PC UP AND RUNNING

 **WINDOWS 8.1**
SAVE TIME WITH THESE
KEYBOARD SHORTCUTS

 **WINDOWS 10**
UPGRADE NOW FROM
WINDOWS 7 OR 8.1!



Windows

Help & Advice

GET STARTED WITH WINDOWS 10

It's time for the ultimate free upgrade!

- Meet Cortana, your personal assistant
- Discover the new Virtual Desktops
- Get going with the Start menu

50
PAGES OF
STEP-BY-STEP
WINDOWS
GUIDES!

WINDOWS 8.1

64 of the best free
programs for your
Windows PC!

ON TEST HP SPECTRE x360 TABLET PC

PLUS: The latest laptops for
Windows 10 reviewed on p82



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Windows Help & Advice

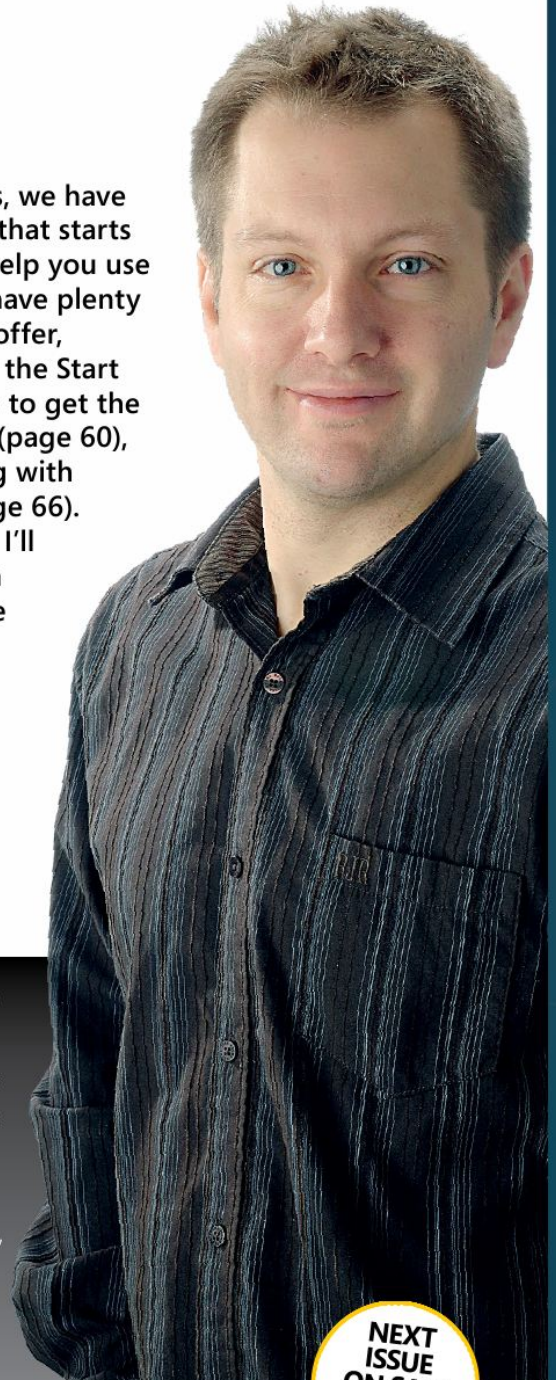
Welcome

It's here! By now you might already be using Windows 10. If you're not, and you've been waiting for us to give you the nod, then don't delay! Unlike previous versions of Windows, Windows 10 is free to upgrade from Windows 7 or Windows 8.1. To make life even easier, by the time your computer prompts you to upgrade (just look out for the notification), it will have downloaded Windows 10 in the background, so it's ready for you to install straight away.

If you need any tips, we have an installation guide that starts on page 50. And to help you use the new system, we have plenty of great tutorials on offer, including how to use the Start menu (page 56), how to get the most out of Cortana (page 60), and how to get going with Virtual Desktops (page 66).

Enjoy the issue and I'll see you next issue on 28th August for more from the wonderful world of Windows!

Graham Barlow Editor-in-Chief
www.facebook.com/windowsmag



SUBSCRIBE TO THE MAG TODAY AND SAVE – JUST TURN TO PAGE 30!

We pride ourselves in being the only magazine on the shelves to show you exactly how to get the best from the Windows operating system, whether it's Windows 10 or Windows 8.1. *Windows Help & Advice* also comes with a disc, on which you can find some of the great apps covered in the magazine. If you get a chance, take a look at how you can even read the magazine on your laptop, phone or tablet.



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Windows Help & Advice

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Microsoft's digital assistant has now made its way onto the PC desktop

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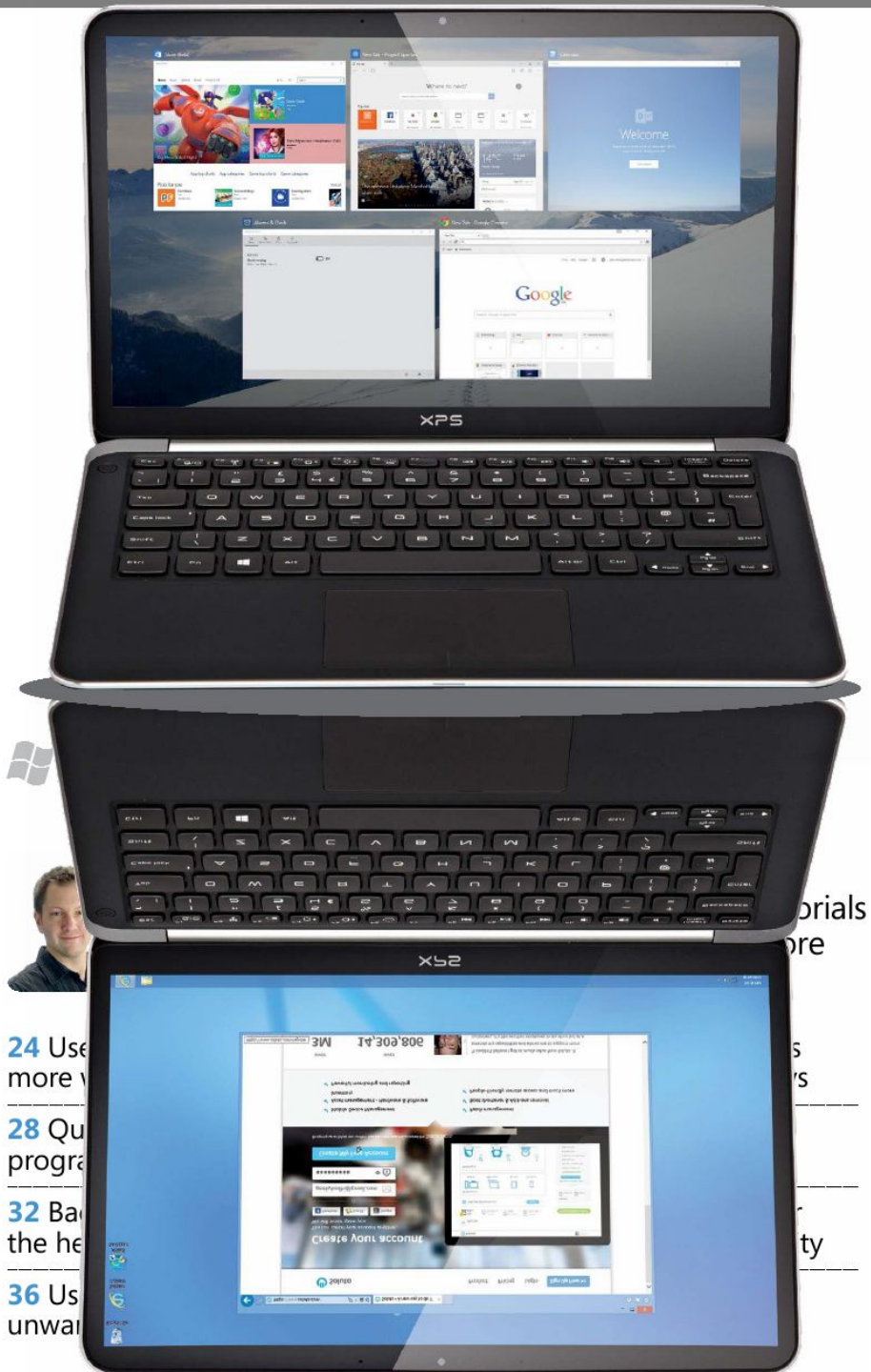
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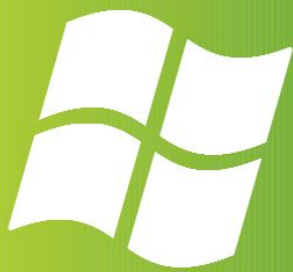
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▶ NEW THINGS TO DO ▶ AMPLIFYING



DIY DRAGON Get going with your very own animation using free PC software

Moving pictures Get animated on your Windows computer

There's never been a better time for Windows users young and old to try out the fun art of animation

Computers and animation have always gone hand-in-hand, whether it's the undulating Windows loading screen or a cutting-edge CGI movie rendered on a Hollywood supercomputer. Animations can be great fun to make, too. Thanks to the way computers work they're easier than ever, requiring none of the hand-painted individual cells which defined the days of Disney. Kids, especially, can enjoy aping the cartoons they see on TV while indulging their artistic tendencies, and then gleefully show off their creations to their friends and family.

The best way to get started doesn't need any drawing talent. PowToon (www.powtoon.com) includes ready-made animated characters and backgrounds, and, after a short tutorial, you'll be able to create your own short film, or customise ready-made ones. The site makes its money through paid-for content, but you

can use it for free as a comprehensive introduction to the basics of animation.

Another way to create an animation is with stop-motion, the same technique used by Aardman Animations to create *Wallace and Gromit* and *Shaun the Sheep*. You'll need some movable props – Lego figures are great for this – and a static camera to capture your subject in a variety

"Kids can enjoy aping the cartoons they see on TV while indulging their artistic tendencies"

of sequential poses. Once you've got your images you can stitch them together into an animation using software, such as Windows Movie Maker.

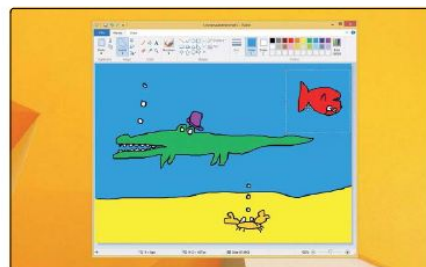
If you've been anywhere near the internet recently chances are you've encountered a GIF, short looping animations without sound. It's very easy to create your own from YouTube videos. Simply find the video you wish to create the GIF from, then copy its url. Now visit www.gifyoutube.com, paste the url, choose a start and end time (shorter is better), then click 'Create GIF'.

HOW TO Create a frame-by-frame animation

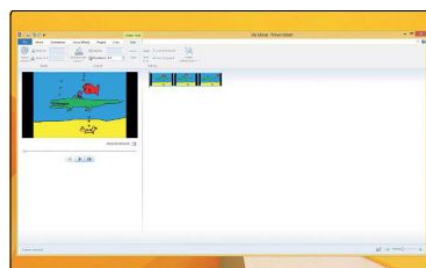
Creating your animation from scratch is easy to do with programs that are freely available for Windows. Download and install Windows Movie Maker from <http://windows.microsoft.com/en-gb/windows-live/movie-maker>, and you'll also need some image-editing software in order to create the frames of your animation. Here we use Microsoft Paint, but the free Paint.Net (www.getpaint.net) gives you more features and control.



CREATE Draw a backdrop and add characters. Begin with basic shapes and bold colours



MOVE Save your first image and use the selection tool to highlight and move part of it. Save and repeat



ANIMATE Open Movie Maker and import the image files. Select them all, then use the Edit tab

The Knowledge... + ◀▶



Semantic Paint

Is this a new Dulux range?

No. The first answer's always no. Semantic Paint is a Microsoft project that uses the company's Kinect Xbox camera to scan in the world around you in real-time, and recognise objects.

So why does it have the word 'Paint' in its title, then?

This is the clever bit – as it can recognise objects, you can virtually paint them different colours in real time. It will even understand your fingers and feet so you can sweep across the real objects with bursts of colour.

What purpose does it serve?

Semantic Paint has a bunch of potential applications. If you're thinking of repainting your living room you can see exactly how it'll look in a shade of bright fuchsia, and it could be implemented in car or furniture showrooms to give an idea of your colour options.

How does it work?

Typically in order to repaint things in real time you'd need to create a 3D model of the object within a computer. Semantic Paint bypasses this process by distinguishing edges of objects as it moves around. It requires a few training sessions in order to recognise objects, but from there it works surprisingly accurately.

That sounds pretty clever.

It is rather. It's a great example of 'machine learning', as the more people use it and feed back objects to the cloud, the quicker and more accurate it becomes. Eventually it'll build a huge library of objects so it'll recognise things instantaneously.

When can I get it?

It's merely a research project at the moment, but this could become a big part of Microsoft's HoloLens augmented reality system (see our feature on page 68 for more). Potentially this means that users could wear a headset and completely recolour the world around them.



HENRY WINCHESTER
TECH EXPERT

WINDOWS INSIDER

EXPOSING YOUR PC'S SECRETS

Windows Vista

Disable Sidebar

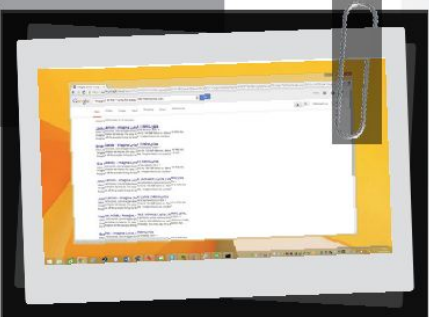
The Sidebar was one of Windows Vista's big selling points. As its name suggests it's a neat little toolbar, which sits to the right of your desktop, displaying useful information such as the time, weather and news. However, it's about as safe as a round of golf in a thunderstorm. It seems that naughty internet people worked out how to use the Sidebar and its gadgets to execute malicious code and potentially ruin your PC. Microsoft recommends turning off the Sidebar indefinitely, and it's even provided a tool to quickly remove it. Visit <https://support.microsoft.com/en-us/kb/2719662> and (somewhat confusingly) download and run the 'Enable' Fix It.



Windows 8

Remove Properties

When you take a photo with a smartphone or digital camera, a bunch of metadata is embedded in the file. This can include technical details such as focal length, but it can also record personal information such as the precise time the photo was taken, and even its location. Thankfully, you can use Windows 8's tool to quickly and easily remove all or selected information. Find the relevant photo in Windows Explorer, then click the arrow below 'Properties' in the toolbar, followed by 'Remove Properties'. Now you can choose certain properties to remove, or create a new photo with all data wiped.



Refine and master Google Search

Googling has become a big part of our everyday lives, but few know of the nifty shortcuts that can make your search engine skills even better. Putting something in quotes means Google searches for a complete phrase rather than individual words, which is handy when you're typing in names. An asterisk operates as a wildcard, so you can use that in place of words in a phrase. Finally, typing your query followed by 'site:www.microsoft.com' (for example) will limit your search to that site in particular, which is useful if you're searching for an item in a shop.

Struggling to get something to work? Need a tip?

Then email us your woes (to windowsmagazine@futurenet.com with the subject line 'Windows Insider') and we'll share your perfect Windows tweaks in a future issue.

Tip of the month

Data demolition

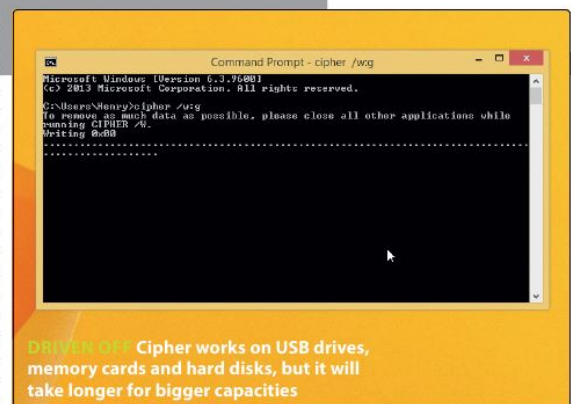
Use Cipher to scrub drives

Windows 8

Selling your computer or its disks? This handy Microsoft tool will ensure they're squeaky clean

When you delete a file from your hard drive it doesn't actually go anywhere. Instead, Windows removes its index so it doesn't show up in Explorer, but the constituent parts of the file stay in place until they're overwritten with new data. This means that hard drives can run quickly and efficiently, but it carries with it the risk that anyone will be able to recover your old files. Fortunately, Windows 7 comes with

Cipher, a built-in tool which makes sure your drives are fully cleansed of all the bits of old files. To run it, click the Windows button, then type `cmd`, and hit enter. Next type `cipher /w:x`, where `x` is the letter of the drive you wish to empty. It might take a little while but Windows will now remove any file leftovers, while it leaves other content intact. This is useful if you're selling your PC or hard drives.



DRIVER OFF Cipher works on USB drives, memory cards and hard disks, but it will take longer for bigger capacities

Get up to speed

The State of the Internet

The UK's mobile broadband might be the fastest in the world – but fixed connections are still lagging

After years of lagging behind the rest of the world in terms of broadband speeds, it seems that the UK is finally catching up – and overtaking – other countries. According to this year's State of the Internet report, from content delivery system Akamai, the UK has the fastest average mobile broadband speeds on the planet.

In the UK, the average 4G speed clocks in at a whopping 20.4 Mbps. In second place comes Denmark, where the connection speed is 10 Mbps – less than half the UK's figure. And everywhere else in the world is slower still, all the way down to Vietnam's paltry 1.3 Mbps.

While we may have the fastest connection speeds on our mobiles, home connections are a different story. South Korea tops the charts, with an average fixed connection speed of 23.6 Mbps, with Ireland coming second (17.4 Mbps) and Hong Kong third (16.7 Mbps). The UK sits further down the chart, with an average speed of 11.6 Mbps. The UK's rather more

lowly status in the global landline charts is partly down to the vast speed discrepancies between urban and rural broadband. In the middle of tech-centric Bristol, for instance, speeds top out at 36 Mbps. But head west to rural Exmoor and the average speed dips to just 0.9 Mbps.



It's an issue that BT – which supplies fixed broadband lines – has pledged to solve, but frustrated West Country MPs are concerned that the rollout of superfast rural broadband will take too long. Chaired by Bridgwater and West Somerset MP Ian Liddell-Grainger, the all-party parliamentary group has doubts that BT will meet its promise of superfast broadband for 95 per cent of homes and businesses by 2017.

As a result, satellite and wireless broadband solutions are filling the gaps in BT's infrastructure. Satellite broadband can deliver speeds of up to 22MB, while a wireless solution, such as Airband, beams fast internet to multiple residencies. But these are mere sticking plasters on a greater problem – that BT has let down rural areas in terms of broadband speeds.

Download this...

Hyperlapse

research.microsoft.com/en-us/um/redmond/projects/hyperlapseapps/

Action camera videos are the new slideshows. We used to bore friends and family to tears with a seemingly endless succession of holiday snaps; now force them to endure hours of video shot from a first-person perspective. You can, of course, speed up these videos, but the result is often jerky and headache-inducing, especially if they're jittery in the first place.

Enter Microsoft's Hyperlapse. Developed by boffins at the company's research lab, it analyses frames of video for certain objects, and stitches them together, while speeding up the video at the same time. The result is a silky smooth version of any first-person activity, from an open-top bus tour of the Champs-Élysées to a strenuous climb up the Matterhorn. It's a lot of fun to play with, and it'll save your loved ones many hours falling asleep in front of your computer screen.



HYPERSPACE Microsoft's new software is free to download, and there are Android and Windows Phone versions too

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THE 60-SECOND QUIZ

Pens at the ready, your time starts now!

1 Which noted watch maker will release its very first smartwatch next year?
A. Sekonda
B. Omega
C. Casio

2 A MasterCard app will use what to verify transactions?
A. Tongue prints
B. Selfies
C. Voice recognition

3 Remy Martin cognac bottles are to include NFC chips – but what does NFC stand for?
A. Not For Children
B. Near-Field Communication
C. Networked File Clearance

4 Nathan Drake is the protagonist of which game series?
A. Bioshock
B. Uncharted
C. Half-Life

5 Upcoming Apple CEO biopic Steve Jobs features which actor in the lead role?
A. Ashton Kutcher
B. Michael Fassbender
C. Ewan McGregor

6 What is the BBC's Micro Bit?
A. A technology TV series
B. A Twitter-like news website
C. A tiny computer

Answers 1.C. 2.B. 3.B. 4.B. 5.C. 6.C.

NEXT ISSUE ON SALE

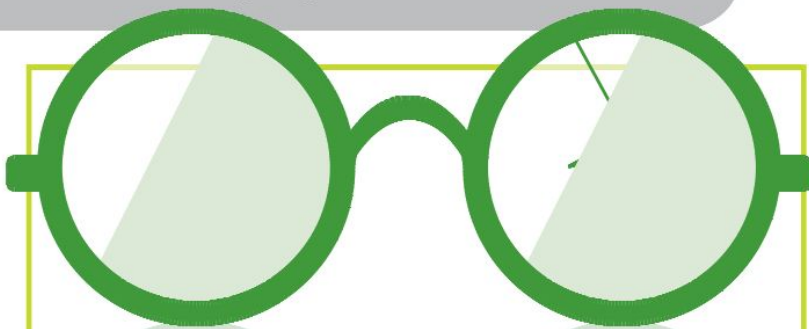
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Friday

Facts & figures

Henry Winchester reveals a host of fascinating digital facts



SHOULD CYBERBULLYING BE A CRIME IN THE UK?

There's no law in the UK specifically against cyberbullying - instead it's considered a criminal offence under numerous harassment and malicious communications acts. New Zealand, however, has just passed a law that deals directly with cyberbullying. Parties could face two years in jail if they're found to have caused "serious emotional distress," plus an additional year if they've incited suicide.



...know how to use an iPad, according to the University of Iowa. The team looked at hundreds of YouTube videos for an insight into how children use Apple's ubiquitous tablets. Toddlers who use one finger to interact, rather than their whole hands, were judged to have mastered the touch-screen tech.

£1 MILLION

The amount EE has been fined by communications industry regulator Ofcom. The UK mobile phone operator was handed the penalty after it was found customers hadn't been issued alternative dispute resolutions, which allow them to pursue complaints via an independent body. EE is keen to point out complaints about the company are down 50 percent from last year, and says it's rectified the problems that led to the fine.

23 PERCENT...

...of British children believe playing videogames with friends is a form of exercise, according to a report from the Youth Sport Trust. While it's an alarming figure, three quarters of children say they enjoy PE lessons and 40 percent would like to play more sport. The trust suggests that integrating technology into activities is the key to keeping the younger generation fit, healthy and enthusiastic about the outdoors.





HOW MANY WATCHED E3?!

The Electronic Entertainment Expo – aka E3 – has become a key date in any gamer’s diary. The LA-based show is host to game announcements and updates to key titles. This year it was livestreamed online via gaming site Twitch.tv, where 21,038,004 viewers tuned in. Between them they watched 11,986,000 hours of footage – the same time it would take to travel to Pluto and back 72 times.

BILL GATES GIVES BILLIONS TO CHARITY EVERY YEAR – BUT WHERE’S IT GOING?

\$28 BILLION INITIATIVES FOR BETTER HEALTH, EDUCATION AND ECONOMIC DEVELOPMENT IN DEVELOPING COUNTRIES

\$10 BILLION DEVELOPING AND DISTRIBUTING VACCINES FOR CHILDREN IN DEVELOPING COUNTRIES

\$957 MILLION GAVI ALLIANCE FOR DELIVERING VACCINES

\$755 MILLION THE ROTARY INTERNATIONAL FOUNDATION FOR POLIO ERADICATION

\$500 MILLION GLOBAL FUND TO COMBAT AIDS, TUBERCULOSIS AND MALARIA

TOP NETMUMS FACTS



The parenting website was founded by Siobhan Freegard, Cathy Court and Sally Russell, who met at a West London playgroup in 2000.



Siobhan’s original idea for the site was to bring mums, dads and carers together. 1.6 million people have since signed up.



Collectively Netmums have more than 2,000,000 children.



The initial website consisted of four local sites for North-West London, but it now features 151 covering every area of the UK.



Over 150,000 places to go to and things to do are listed over the local sites.



In 2004, Netmums launched its Coffeehouse, a friendly forum with more than a hundred subjects to chat about.



Every month some 4,000 mums are introduced via Netmums’ Meet-A-Mum board.



Feeding Kids, Netmums’ first book, was publishing in 2007. The site has since published eight more.



The majority of Netmums’ users – 63 percent – have children aged between two and four.



Last year Freegard, Court and Russell were awarded OBEs for services to families. Freegard estimates the site itself is worth £50 million.



DO YOU SUFFER FROM DIGITAL AMNESIA?

It’s easy to turn to your smartphone when you can’t recall a fact, but this reliance on Google could lead to ‘digital amnesia.’ According to software security company Kaspersky Lab, 71 percent of connected adults can’t remember their children’s phone numbers, while 49 percent don’t know their partner’s. The researchers believe that this forgetfulness is a direct consequence of our brains adapting to the internet.

THE BEST FREE WINDOWS 8.1 PROGRAMS

The 64 free programs every user should have installed on their Windows 8.1 PC, collected and compiled by our experts

We've all learned to think before we click, whether we're browsing the web, checking email or scrolling through tweets. Yet it's easy for the occasional threat to pass beneath the radar. As the world's most widely used desktop operating system, each new version of Windows has seen improvements where security is concerned, much of it built in at the core. There are also add-ons such as Microsoft Security Essentials, phishing detection for Internet Explorer and an improved permissions system.

Even so, there's still more you can do to keep your PC safe. We'll reveal the true scale of international phishing, what proportion of global email traffic comprises spam, and the ways social networking can be used to make you click a false link. We'll explain how to verify email senders, identify when a site is hosted on an unfriendly third-party server, and show you how to enable two-step authentication to protect sensitive data and online accounts.

Some steps require re-thinking the way you work and play online, but none need third-party software or tools. They won't cost you a penny, either. Let's get started!

SAMSUNG

Windows
64 free programs



MEDIA

1 AUDACITY

<http://audacity.sourceforge.net>

Audacity is an audio recorder and editor with a lot of depth. If all you want to do is record a little audio from your microphone or line-in port you don't need to go too deep, but dive down and you'll find multi-track editing and mixing, a bank of effects and post-processing tools, as well as the ability to convert your audio from one format to another.

2 DARKWAVE STUDIO

<http://bit.ly/1ww8KAE>

Professional digital audio software can be expensive: Cubase, for example, costs around £400. But why spend that much? Darkwave Studio is a free digital audio workstation that supports multi-track hard disk recording, and VST plug-ins for effects and sounds. This makes it flexible, and suitable for all your music-making and audio-editing needs.

3 STUDIO ONE FREE

www.presonus.com/studioone

PreSonus' Studio One Professional (£315) is making waves in the upper echelons of audio recording and editing, but the free edition – cut down as it is – is the perfect way for beginners to learn the ins and outs of its powerful tools, and perhaps produce something that sounds great in the process. The help files are useful if you're new to digital audio.

4 PLEX MEDIA SERVER

<https://plex.tv>

Plex is excellent. It's more than just a program – it's an ecosystem. Show it your media, leave your PC running, and you'll be able to stream video directly to smartphones and other devices in your home. If you have a fast enough connection and a hefty enough PC, you can also send video over the internet and share it with your friends, converting the video on the fly to whatever format suits their connection and device. You can even share libraries with your loved ones.



DARKWAVE STUDIO Unleash your inner musical *auteur* with Darkwave Studio

5 FOOBAR2000

www.foobar2000.org

We're not about to tell you that Windows Media Player is rubbish – it's absolutely not. But when you want something super-lightweight to play your music, there's nothing better than Foobar2000. It supports customisable skins, gets up and running in picoseconds, plays virtually every audio format, and you can even use it to rip your CDs to MP3s.

6 VSDC FREE VIDEO EDITOR

www.videosoftdev.com

There are very few competent video editors out there that don't ask you for upwards of £60, and Adobe's Premiere Pro comes in closer to £600. Even though VSDC Free is – you guessed it – free, you'll have to work with a relatively unconventional non-linear editing interface to make the most of its myriad transitions and effects.



7 KODI ENTERTAINMENT CENTER

<http://xbmc.org>

Formerly known as XBMC, Kodi is a great alternative to Windows Media Center if you want to tool up a PC for playing all sorts of media. You can easily change the way it looks, hook it up to TV capture cards, grab movies and music from networked drives, and even extend its functionality with a huge catalogue of time-tested plug-ins.

8 VLC

www.videolan.org/vlc

VLC is our favourite third-party media player. It isn't that pretty, but its compatibility with multiple formats is unparalleled. It also includes features that will help make glitchy videos more enjoyable: for example, use [J] or [K] to shift the audio backwards or forwards by 50 milliseconds to ensure it's in sync.

9 PAINT.NET

www.getpaint.net

This advanced replacement for Windows' built-in Paint program has been around for a long time, but we still love it. It's easy to use, with an interface similar to Paint itself, but includes many more advanced features and tools. If you're looking to tweak a few photos, we can't recommend Paint.NET highly enough.

10 GIMP

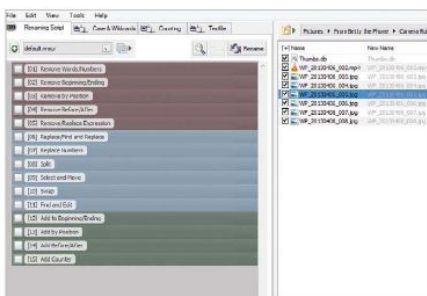
www.gimp.org

If you're a regular reader, you'll have seen a lot about Gimp in these pages, and for good reason. It's a free alternative to Adobe Photoshop, so you're saving up to £1,000 on the sort of image-editing power you need to make your photos look incredible. There are occasional glitches and slightly fewer tools, but we love it.

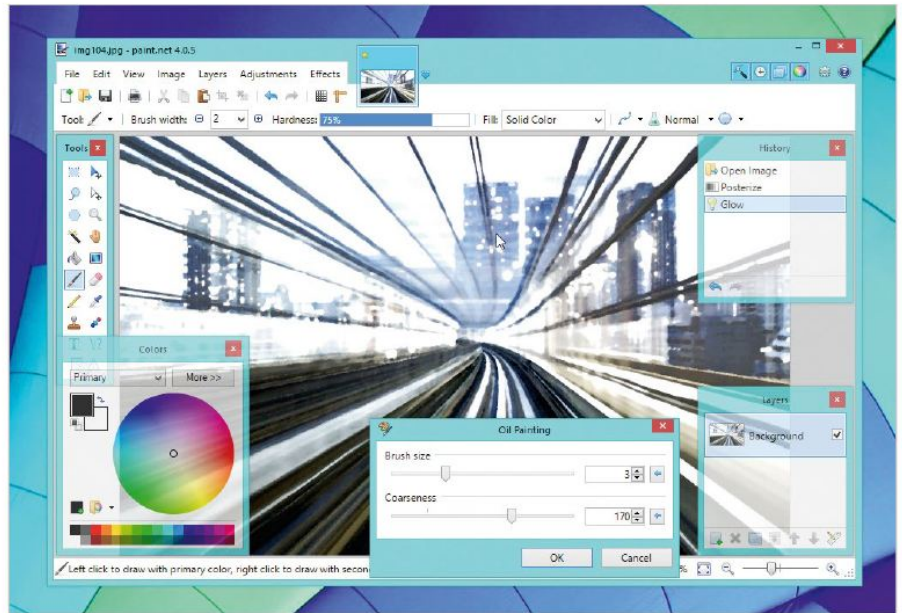
11 PAINTTOOL SAI

www.systemax.jp/en/sai

Directly from Japan comes PaintTool SAI, a beautiful app that will help you and any



RENAME MASTER Take the pain out of file management with this batch-renaming app



PAINT.NET This freebie app is an ideal drawing and image-editing package for beginners

junior users paint with natural-feeling brushes. It works best with a graphics tablet, of course, but its range of simulated tools are also perfectly usable with a mouse, and you may be surprised by the sort of results you get. Perhaps you're an artist at heart and you don't even know it!

12 ZONER PHOTO STUDIO FREE

<http://free.zoner.com>

Zoner PhotoStudio Free puts a huge palette of photo-editing tools at your disposal, but that's not why we've included it here. What we love are its photo-management options, which can take snaps from your camera and put them straight into a neatly organised album. Next time you need to find that vital photo of your cat pulling a funny face in a hurry, you'll be able to put your finger on it in a matter of moments.

13 GADWIN PRINTSCREEN

www.gadwin.com/printscreens

Here's a tool you probably didn't think you needed, particularly because Windows has a decent screenshot function built-in. But will Windows let you take screenshots at timed intervals? Will it let you easily change the hotkey, or choose to capture the mouse pointer? It won't – but Gadwin will.

14 RENAME MASTER

www.joejoesoft.com/vcms/108

Few things annoy us more than the filenames cameras give to photos, not to mention how tedious it is renaming them.



VLC We've yet to find an obscure video file format lurking on the net that VLC can't handle

We don't let it get to us, though: we just use Rename Master to quickly retitle batches of photos and other media files.

15 AUDIOGRABBER

www.audiograber.org

It's apparently quite legal to turn your CDs into MP3 files these days, so try Audiograber when you're ready to do away with your old media for good. It queries the Gracenote database to automatically detect which music CD you've put in the drive, and will output fully labelled and tagged files at your specified choice of bitrate.

16 MP3TAG

www.mp3tag.de/en

Get your music collection looking consistent with this app. You'll still need to do a bit of manual labour to make sure everything is tagged properly, but MP3Tag's best feature is its ability to apply certain tags in batches. If your audiobooks aren't being recognised properly by your media player, for example, then with MP3Tag you can change their category in one fell swoop, saving

PRODUCTIVITY

1 LIBREOFFICE

www.libreoffice.org

The latest version of Microsoft Office can set you back up to £180. LibreOffice, on the other hand, costs nothing, and is fully compatible with the files that Microsoft's software pumps out. We're not about to say it's actually better than Microsoft's original offering, because there's a certain flair lacking here, but you won't find a better free office suite anywhere. And if you hate Microsoft's new ribbon interface, you'll be happy to make the switch.

2 ABIWORD

www.abisource.com

If all you need is a word processor, AbiWord can do the job, but it's also capable of a lot more. By connecting to the free AbiCollab.net service, it enables you to work on beautifully formatted documents simultaneously with your friends wherever they are in the world. Even if you're not going to use that feature, it's a lovely, clean, classic word processor.

3 XMIND

www.xmind.net

Mind mapping – otherwise known as brainstorming, if you're of our generation – is perhaps the best way to turn a jumble of random thoughts into a focused and coherent end product. Before you start a project, or perhaps if you hit a dead end, fire up XMind and jot down everything that hits your frontal lobe. You might be surprised what you come up with.

4 EVERNOTE

<https://evernote.com>

We live in fast-moving times and sometimes the internet doesn't think to stop and let us read it, but with Evernote you can mark the things that catch your eye and come back when it's more convenient to catch up on them. You can also make notes (of course) and share everything across all of your devices, including smartphones.

5 COLD TURKEY

www.getcoldturkey.com

How much time do you spend on the internet? And how much time should you *really* be spending on the internet? That's what we thought. Cold Turkey is a neat app that lets you block access to programs, games and even specific websites on a timed basis, so you won't squander all that time when you should be working.

6 NOTEPAD ++

<http://notepad-plus-plus.org>

As its name suggests, Notepad ++ is a souped-up text notepad application. It supports tabs, can format code in text, will reopen recently used documents when it starts, and generally turns basic features of Notepad up to 11. Install it and you'll never want to use Microsoft's app again.

7 INKSCAPE

www.inkscape.org

Vector graphics have advantages over bitmaps: specifically, you can blow them

up to any size without losing quality because they're comprised of individual linked points, instead of pixels. Inkscape isn't the easiest application to master, but if you want to create vector graphics, there's no better free solution out there.

8 GANTTPROJECT

www.ganttproject.biz

Perhaps you're managing a massive project with loads of collaborators. Perhaps you just want to organise a bit of DIY. Whatever you're up to, Gantt charts are a great way to set goals, manage resources and stick to realistic time scales. GanttProject is the best way to get Gantt charts up and running, and it's a lot cheaper than Microsoft Project – which could cost up to £950.

9 SCRIBUS

www.scribus.net/canvas/Scribus

Desktop publishing is a term that's now fallen out of favour, but that doesn't mean it's a job that doesn't need doing. We make this magazine with Adobe InDesign – £400 to you – but for occasional document layouts that don't need that kind of investment, Scribus is fantastic. It'll even output your documents in PDF format ready for printing.

10 TRILLIAN

www.trillian.im

Keeping in touch with multiple people online can be tricky, particularly if some of them obstinately stick to their preferred chat client when everyone else has standardised elsewhere. With Trillian you don't need to standardise. Log in with your Google, AOL and Facebook accounts, and all of your instant messages will end up in one place.

11 ARSCLIP

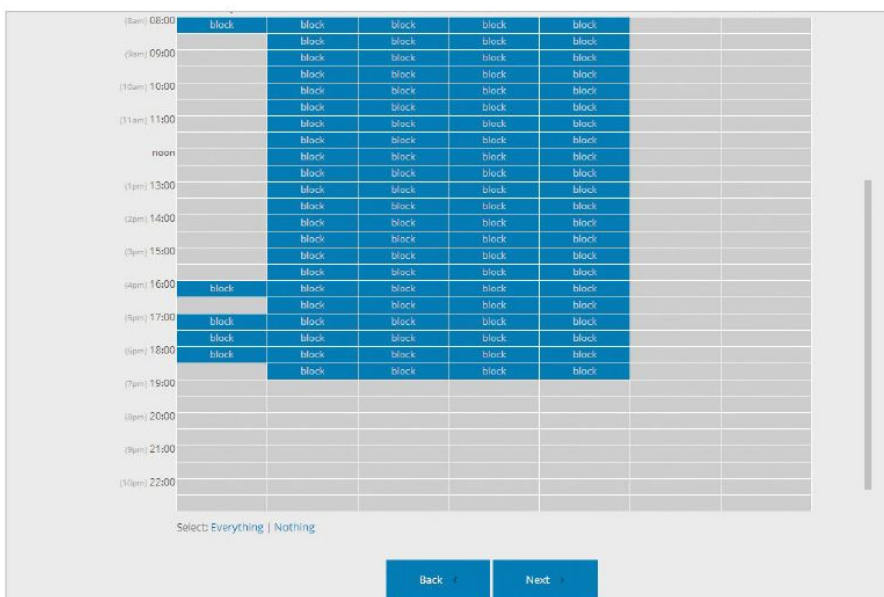
www.joejoesoft.com/vcms/97

The Windows clipboard is perhaps the most useless clipboard in existence, given that it can hold only a single item. ArsClip is much better, giving you a full clipboard history and the ability to set up permanent clipboard items for frequently used data. It even integrates neatly with Windows 7's jump lists. We use it every day, and so should you.

12 UNIVERSAL VIEWER

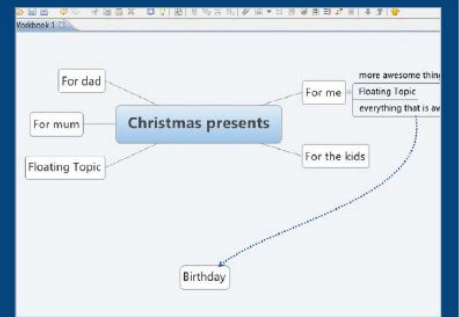
www.uvviewsoft.com

Here's a neat little speed-up for you. Don't worry about sitting around for a minute



COLD TURKEY Facebook and BuzzFeed eating up too much of your day? It's time to go Cold Turkey

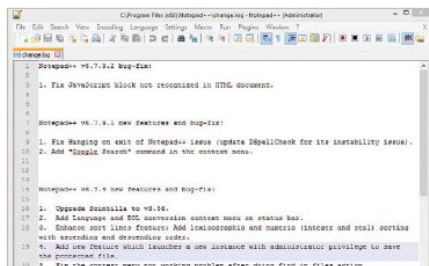
Layout your thoughts with XMind



1 Pick a template
Run XMind and you'll see tons of templates to choose from. You could use these to make an organisation chart, a travel itinerary, a straightforward flow chart and much more. For now, choose the 'blank' template at the top left to get started. It's easy to set your own structure.

2 Add some thoughts
Double-click the single box that appears to edit its label. This is the central tenet of your mind map. Now right-click in an area of empty space and choose 'Floating topic' to create a new box. Double-click it to label it, then drag it near to the main box to link the two.

3 Spread it out
Creating and dragging further boxes will build a hierarchical structure automatically; you can add a new 'Central' topic if you need to collect diverse thoughts into the same mind map, or add a relationship to draw a non-automated line between different points of your map.



NOTEPAD++ Windows' own Notepad app is good, but Notepad++ is double-plus good

while Microsoft Office opens, when all you want to do is look at the contents of a .doc file. Universal Viewer will open files of many types much faster than their parent applications. You can't edit them within Universal Viewer, but it's extremely helpful for working out which file is which.

13 TIGHTVNC

www.tightvnc.com

VNC stands for Virtual Network Computing – the practice of controlling a remote machine as if you were sitting at its mouse and keyboard. With a TightVNC server installed on your target machine, you can use the client to jump on and control it. TightVNC is the fastest VNC solution we know of – it even beats Microsoft's own Remote Desktop.

14 TEAMVIEWER

www.teamviewer.com

If VNC sounds a bit complex, or if you might need to gain control of the computers of people who wouldn't understand it, Teamviewer is absolutely perfect. It doesn't even need to be installed. Just open it, enter the unique address and password that the app displays on your target

machine, and you'll be able to log in and see what's going on. It's so easy!

15 FILEZILLA

<https://filezilla-project.org>

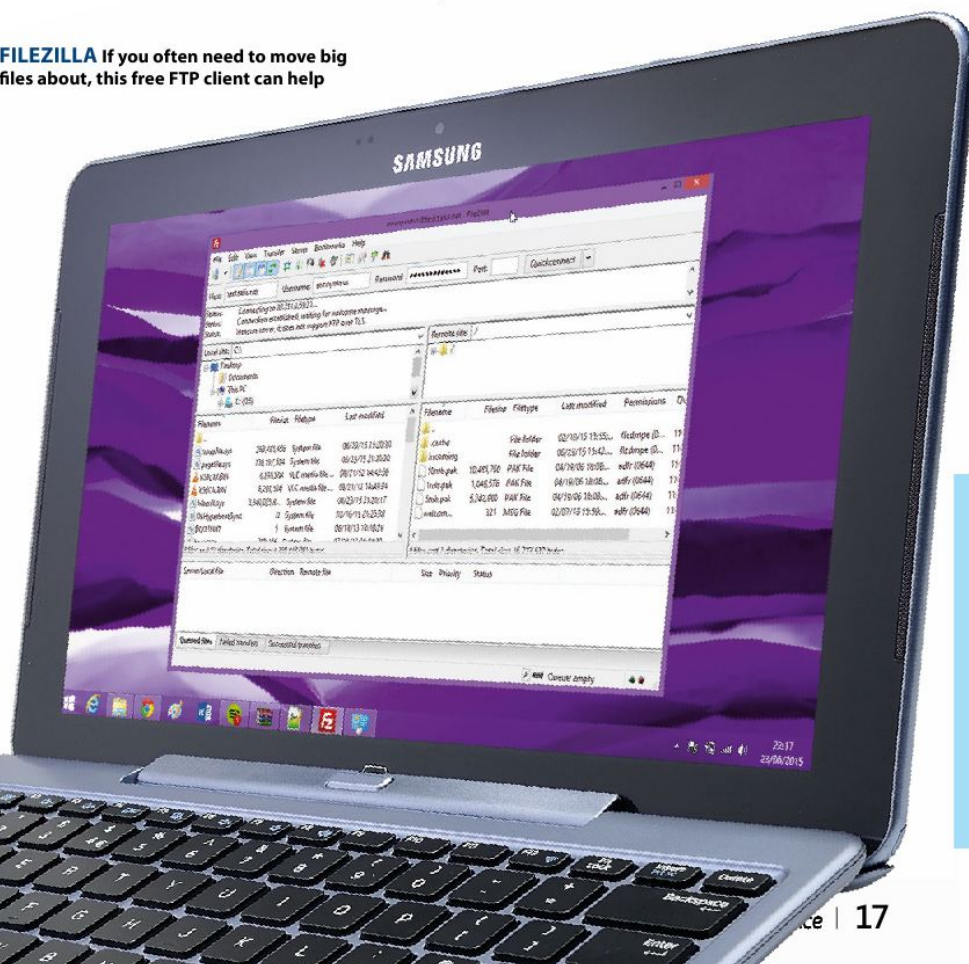
FTP is an internet protocol (similar to the HTTP you see in your web addresses) focused specifically on file transfers. You might not have much cause to use it, but we can't sleep if Filezilla isn't installed on any machine we're using. It's by far the best FTP client out there, and makes uploading and downloading large files quick and easy.

FILEZILLA If you often need to move big files about, this free FTP client can help

16 TWEETDECK

<https://tweetdeck.twitter.com>

Tweetdeck started as an independent Twitter desktop app, before being bought out by Twitter itself. It will come as no particular surprise then, that this is easily the best way to connect with your Twitter accounts. You can view multiple accounts, see live updates of your feeds, get pop-ups when you're mentioned or sent direct messages, and completely customise the interface to suit you.



SYSTEM

1 CCLEANER

<http://bit.ly/1hsOdVC>

CCleaner's sole purpose is to make your PC run faster by removing old unused files and generally optimising the way Windows runs. It's easy to use, it's a small install, and you will notice a genuine difference once it's done its thing. There's no reason not to try the free version out – although we might not pay £30 for the full thing.

2 PC DECRAPIFIER

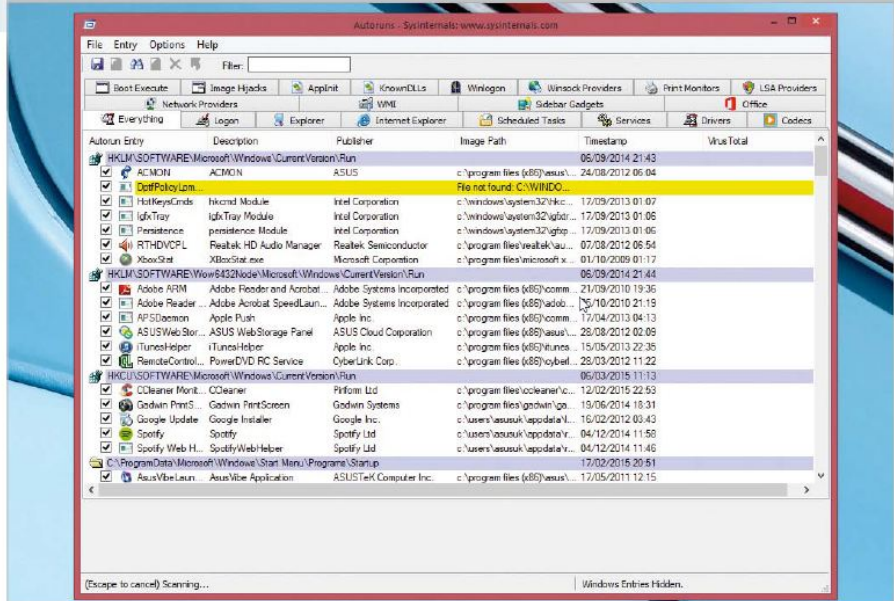
<http://pcdecrapifier.com>

Buy a new laptop, and it will inevitably come pre-infested with a host of unwanted software, which will slow it down for no good reason and batter you with annoying pop-ups. You could painstakingly remove each program yourself, or you could let PC Decrapifier scan its extensive database and remove it for you automatically. If you need a hint: choose the latter option.

3 SPYBOT SEARCH AND DESTROY

www.safer-networking.org

Spyware can trick the best of us. Click a legitimate-looking link, install a seemingly



AUTORUNS Slash your boot-up times by ditching the stuff you don't need

innocent bit of software, and you can find your PC slowing down, your personal information getting shared with criminals, or your web browser being taken over by sites you have no intention of visiting or interacting with. Spybot searches for this menace and destroys it.

4 MALWAREBYTES ANTI MALWARE

www.malwarebytes.org

Why have we listed two bits of anti-malware software in this round-up? Because you absolutely need both. If your sluggish PC is the subject of a malware infestation and Spybot hasn't done the trick, take advantage of Malwarebytes' comprehensive database and let it remove the problem for you. Two programs working in tandem are much more effective than one alone.

5 AUSLOGICS CLEANER

www.auslogics.com/en/software/registry-cleaner/

Registry-cleaning tools can help fix problems by tracking down rogue entries and deleting them. The trick is knowing how to use them carefully, so don't use this free app unless you are confident you know what you're doing!

6 AUTORUNS

<http://bit.ly/1joclBf>

When your PC starts up, what exactly is making it take two minutes for the hard disk to stop spinning? Autoruns can tell you exactly what's running, and it'll let you disable non-essential programs and services too. Treat this one with kid gloves, though – you could stop Windows from booting up properly if you're too gung-ho when disabling applications.

7 WINDIRSTAT

<https://windirstat.info>

We can proudly say, this is one of our absolute favourite programs. Run it, let it grind away for a while, and it'll show you a visual map of your hard drive. Pretty cool. It's particularly useful if you're running out of drive space, as it can direct your attention to those long-forgotten files and folders that are hogging all the precious capacity. You can even delete them from within WinDirStat, clearing huge chunks of your hard drive in one visually appealing sweep.

WINDIRSTAT Create a roomier PC with this astonishing program



8 TIMESNAPPER CLASSIC

<http://bit.ly/1tCjnOJ>

There's nothing worse than a crash – particularly one that doesn't give your software time to autosave the work you were doing. Leave Timesnapper Classic running, however, and you'll have at least a little peace of mind. It takes screenshots at regular intervals; just open up the most recent snap and you should be able to rebuild the bits you were last looking at.

9 AUTOHOTKEY

www.autohotkey.com

We could all be more efficient and even moving your hand away from the keyboard to use the mouse is wasting time and effort. With AutoHotkey, you can create custom key combinations that allow you to run programs and perform common actions quickly. It's amazing what a difference it makes.

10 SYNERGY

<http://synergy-project.org>

AutoHotkey makes you more efficient, but Synergy could be even more effective. Install and configure it on multiple machines, and you can share a single mouse and keyboard between them. Just move the mouse cursor off the edge of one screen – say your laptop – and it'll appear on, for instance, your desktop monitor. It's tricky, but revolutionary.

11 GLARY UTILITIES

www.glarysoft.com

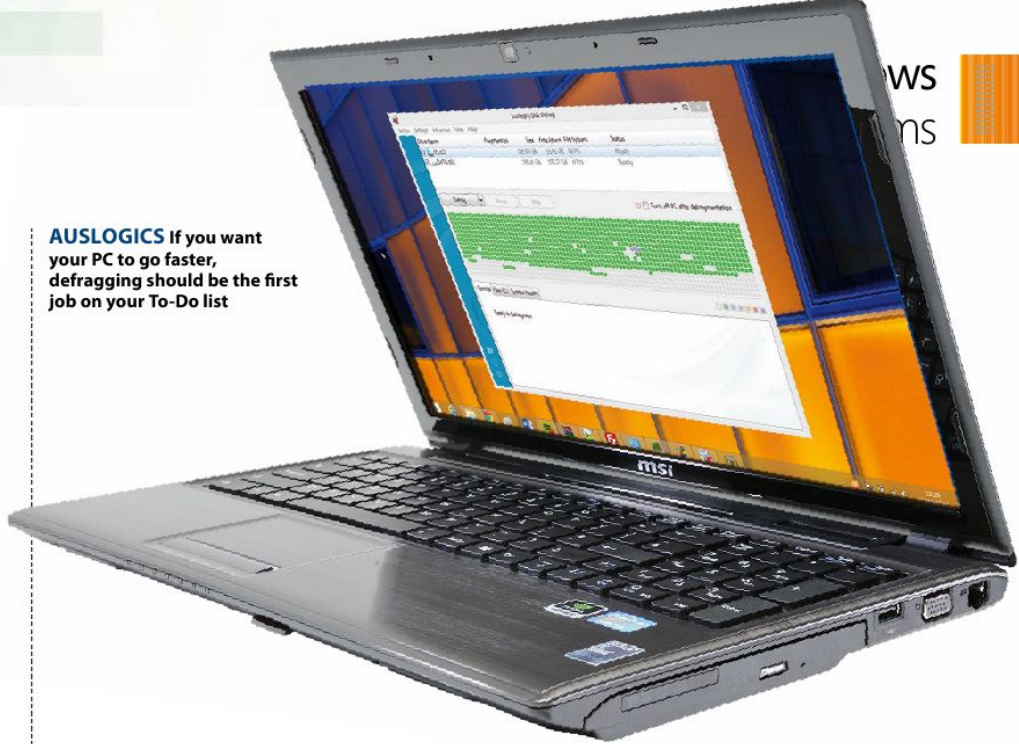
Scan the shelves of your local computer shop and you'll see tons of paid-for system speed-up tools, but don't be tempted by them. Glary Utilities scours your PC's registry, cleans your hard disk, removes duplicate files and more – all for free. There's a pro version that automates many of its processes, but we find you won't need to run it all that often so upgrading is merely a matter of convenience.

12 AUSLOGICS DISK DEFRAG FREE

<http://bit.ly/1kaeyd0>

You may have heard of defragmenting – rearranging the data on your hard drive so that it's all in order, thus speeding up access – but did you know that Microsoft's built-in tool isn't actually the most efficient? Auslogics' defragmenter can make a big difference to your boot times and the speed of loading applications, particularly on well-worn machines.

AUSLOGICS If you want your PC to go faster, defragging should be the first job on your To-Do list



13 ROCKETDOCK

<http://rocketdock.com>

The Start menu is efficient, but not perfect. It can be a little slow if heavily populated, and you need to click it to open it, but it's not the only way to launch the applications you use most often. RocketDock is a very pretty alternative. It's a replacement for the Windows taskbar, and you can customise it with special add-ons.

14 RAZER GAME BOOSTER

www.iobit.com/gamebooster.html

When you're getting serious about gaming, the last thing you want is random Windows components messing with your frame rate. This neat app will disable anything you don't need while gaming, then switch it back on when you're done. The performance boost could save you a graphics card upgrade.

15 FRESHUI

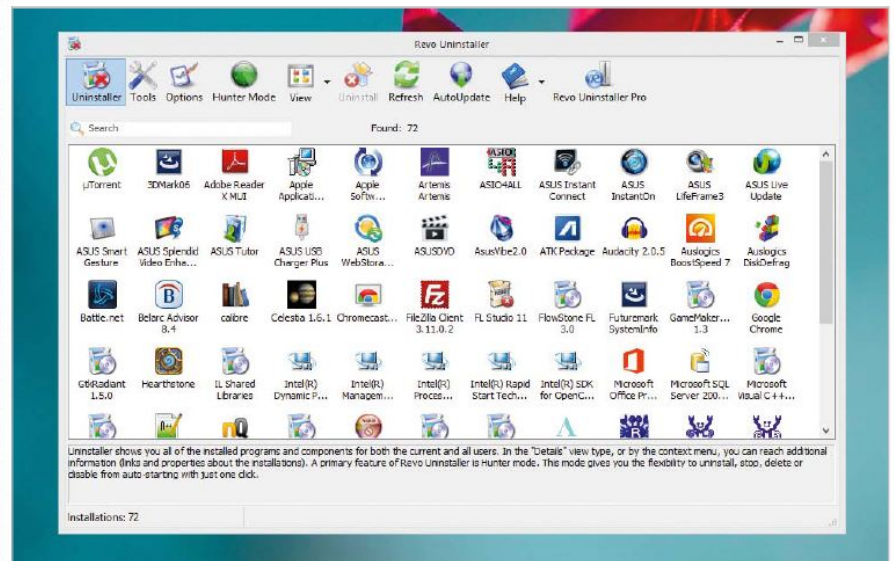
www.freshdevices.com

This tool has been around for ages, and it's perfect for simplifying a PC for a less confident user, or for streamlining your own experience. You can access system settings from one place, and disable features, menus and resource-hungry gimmicks that you don't use. If you find you need them again, it's easy to revert.

16 REVO UNINSTALLER

www.revouninstaller.com

Uninstall a program and it's gone, right? Not quite. But keep Revo Uninstaller around and it monitors installed files and cleans off any hidden extras that the standard uninstall process might miss. This includes everything from redundant files to registry keys left behind. This might only mean a tiny speed boost, but after several programs it all adds up.



REVO UNINSTALLER Getting rid of the junk left behind by deleted software can speed up your PC

SAFETY

1 MACRIUM REFLECT FREE

www.macrium.com/reflectfree.aspx

Imagine the worst – a glass of wine has knocked over into your hard drive, or there's been a small office-based explosion... You'd be glad of Macrium Reflect's ability to make a drive image backup of your system, wouldn't you? Get hold of an external drive first, though as burning your data to DVD is tedious.

2 COBIAN BACKUP

<http://bit.ly/TVkPNE>

Macrium is easy to use, Cobian less so, but we know of no better free product with more backup options. Schedule daily backups, do complete image copies, encrypt or compress your backups to save space – really, any kind of backup task is straightforward to perform. Just make sure you read the help files properly!

3 LASTPASS

<https://lastpass.com>

Leave a weak password on a vital account and your information could be stolen, your privacy compromised, or your bank account emptied. With LastPass, you can generate the most secure passwords possible and store them in an online vault to ensure you're never locked out of anything.



Congratulations!

This browser is configured to use Tor.

You are now free to browse the Internet anonymously.

[Test Tor Network Settings](#)

Search securely with Startpage.

What Next?

Tor is NOT all you need to browse anonymously! You may need to change some of your browsing habits to ensure your identity stays safe.

[Tips On Staying Anonymous »](#)

You Can Help!

There are many ways you can help make the Tor Network faster and stronger:

- [Run a Tor Relay Node »](#)
- [Volunteer Your Services »](#)
- [Make a Donation »](#)

The Tor Project is a US 501(c)(3) non-profit dedicated to the research, development, and education of online anonymity and privacy. [Learn more about The Tor Project »](#)

TOR The Onion Router will keep your online activity safe from prying eyes

4 MAGICAL JELLY BEAN KEYFINDER

www.magicaljellybean.com/keyfinder

If you're planning to reinstall Windows or Office, Microsoft expects you to have your licence key to hand, but that's not always possible. Perhaps it's been rubbed off the sticker at the bottom of your laptop, or maybe you've lost it. Not a problem: just run this handy app before you start reinstalling, and it'll pull your keys from the depths of your PC's innards.

5 AVG FREE ANTIVIRUS

<http://free.avg.com>

There are a host of antivirus packages on the market, but not all are equal. You could pay £60 for Norton 360, but AVG – our pick of the free antivirus packages out there – performs just as well on industry standard tests.

6 DROPBOX

www.dropbox.com

Microsoft OneDrive is all well and good, but we're partial to Dropbox's clean approach to storing your important files online. You can set any folder to be a Dropbox folder – even My Documents – which means your data automatically ends up on its servers, and you can then access everything you need from a mobile device or any web browser.

7 AES CRYPT

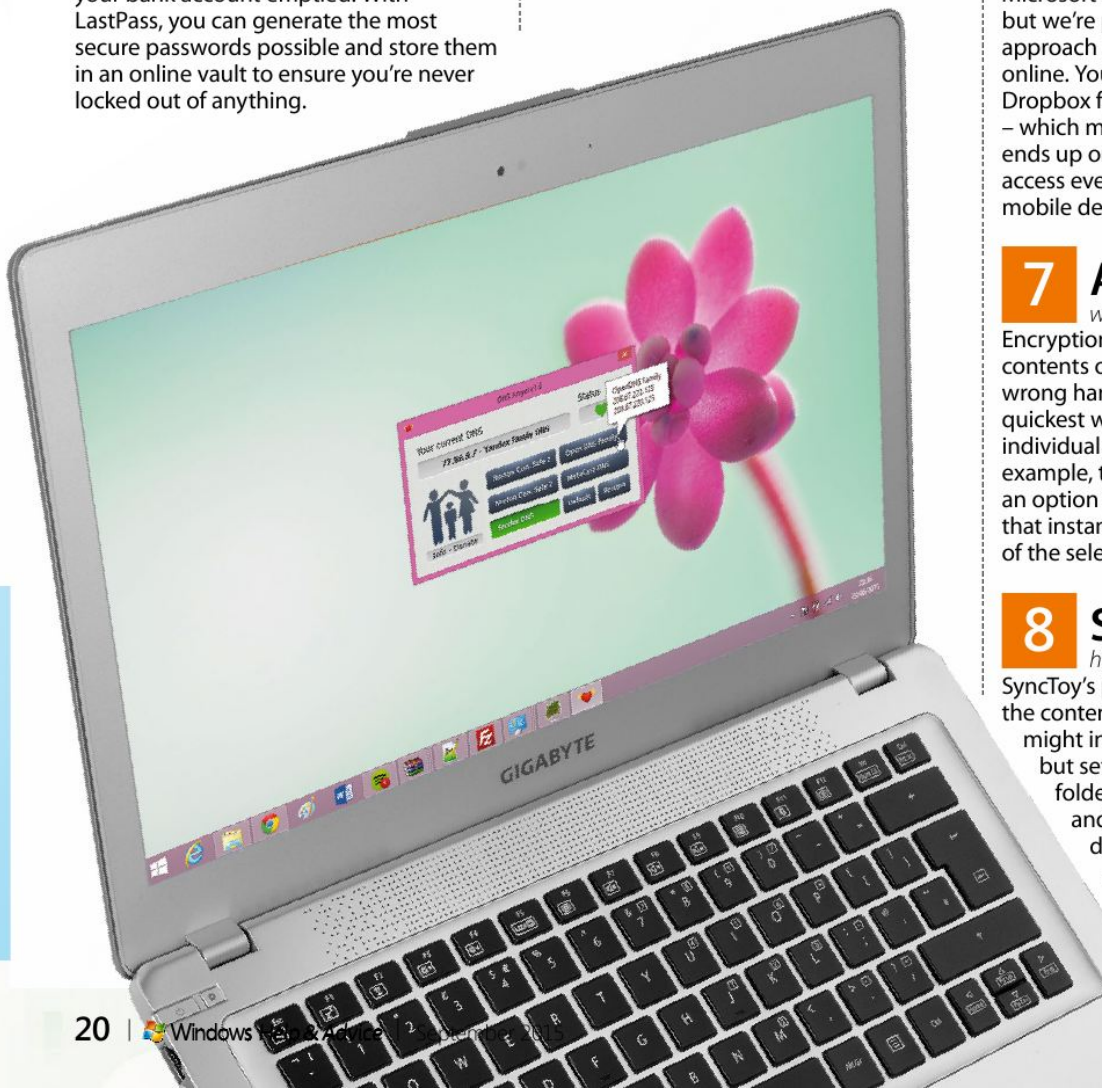
www.aescrypt.com

Encryption is handy if you don't want the contents of a particular file to fall into the wrong hands. AES Crypt is just about the quickest way we know to lock down individual files if you're intending, for example, to send them via email. It adds an option to the right-click context menu that instantly makes an encrypted version of the selected file.

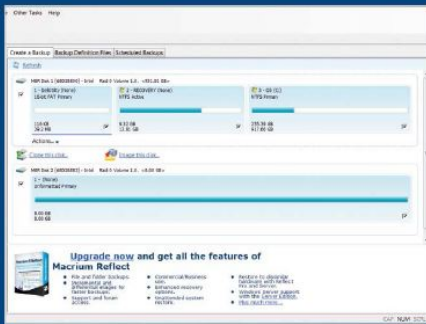
8 SYNCTOY

<http://bit.ly/1cvHhne>

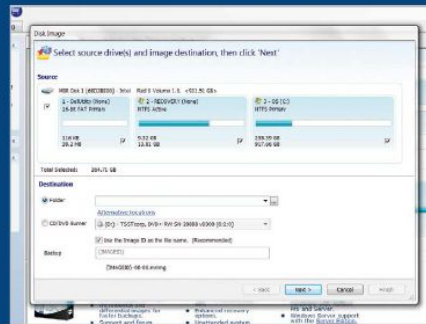
SyncToy's primary function – mirroring the contents of one folder in another – might initially seem rather pointless, but set it up to mirror to a networked folder or one on an external drive, and you can be sure that your documents are saved safely elsewhere, eliminating the risk of data-loss if one drive fails.



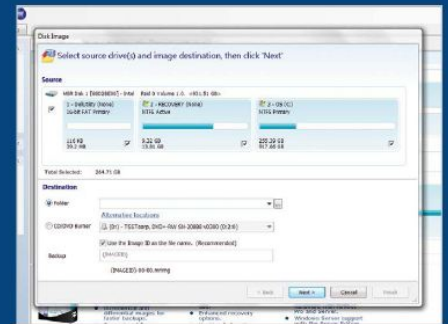
Back up with Macrium Reflect



1 Work with this
Macrium will take a complete image of your hard drive – you may have heard this referred to as ‘ghosting’ – so that in the event of disaster, you can return to the exact state your PC is currently in. Open it up and you’ll see a brief map of your hard drive and its partitions.



2 Back it up
Plug in your external hard drive – obviously this will need to have more free space than the total amount of disk space used on the drive you’re backing up. Click ‘Image this disk’, select the drive you’re cloning onto, then click ‘Next’ to start backing up.



3 To the rescue
In the left column, click ‘Other tasks’ then choose ‘Create bootable rescue media’. Click ‘Next’ a few times, and when prompted insert a USB stick or recordable DVD to use as your rescue media. If things go wrong in future, boot from this and you’ll be able to restore your backup.

9 WINPATROL

www.winpatrol.com

This program sits and waits, casting its eye over the folders commonly used by viruses and spyware to hide their files. If it spots something untoward, it’ll let you know. It also scans for any potentially dodgy programs being run, and keeps a full log of changes, so if you do get infected you can work out the culprit.

10 DNS ANGEL

<http://bit.ly/1tUa0rX>

DNS Angel has two benefits: it gives you the ability to quickly switch between DNS servers, and it offers up a bunch of filtered DNS servers from the likes of Norton and Yandex, which keep inappropriate content away from sensitive eyes.

11 K9 WEB PROTECTION

www.k9webprotection.com

DNS Angel is the simple option, but K9 gives you more control over what can be done online. This ranges all the way from blocking certain categories of content to forcing SafeSearch on all major search engines. It can even auto-assess the content of sites it doesn’t have in its database.

12 REGISTRY BACKUP PORTABLE

<http://bit.ly/1tUa7nw>

Put this program on a USB stick and you can take full backups of your PC’s registry, the registries of other PCs, and those of all users on said PCs. Do this regularly, and you’ll always have a backup to return to if all goes wrong. You’ll be glad you put in the effort.

13 SOPHOS VIRUS REMOVAL TOOL

<http://bit.ly/1lxuOvt>

If a virus has made its way through your usual defences, it’s probably disabled your antivirus software. That’s where this tool comes in. It detects and scrapes away all traces of known viruses – even those your regular protection might have missed.

14 ISPY CONNECT

www.ispyconnect.com

You probably already have a webcam. If you do, then ISpy Connect lets you use it as a security camera, streaming sound and video over the internet and emailing you snapshots of any suspicious activity. It also has other killer features, such as remote desktop monitoring, to let you see if anyone’s up to anything they shouldn’t be.

15 TOR BROWSER BUNDLE

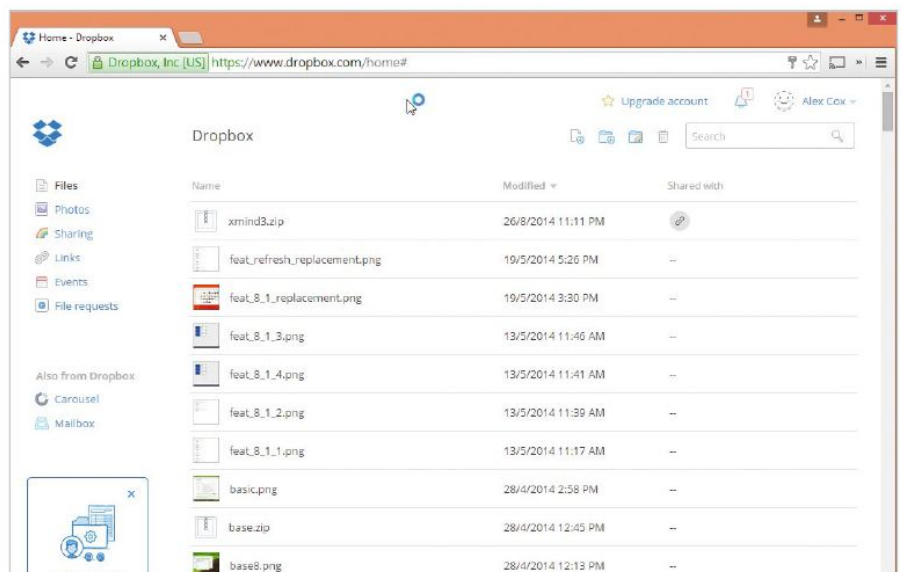
<http://bit.ly/1jdsLFC>

To be certain no one’s snooping on your internet use, install Tor. It anonymises your actions by bouncing communications through a number of machines around the world. It’s slower than a regular browser, but that’s the price of privacy.

16 SOFERVISE

www.rodelliorodriguez.tk

Sometimes all you want to do is block one application. Maybe it’s your web browser, to shield little eyes from the den of iniquity that is the internet. Perhaps it’s your favourite game, locked with a password only your long-suffering partner knows. These things are possible with many filtering apps, but easiest with Sofervise. ■



DROPBOX Cloud storage is all the rage, but Dropbox is a leader in the field for a reason



OilPaint

Standalone App & Photoshop Plugin

AKVIS OilPaint turns your photos into oil paintings.
With this cutting-edge software you can become an artist!



AKVIS.COM



Explore

► WINDOWS TIPS ► INTERNET ADVICE ► EXCITING NEW PROJECTS

Welcome



Whether you're stuck for inspiration or want to become a master of your

Windows computer, our Explore section is the place to come. Each month we pack it with tutorials covering a range of subjects suitable for all levels of expertise.

This month, Matt shows how to make the most out of PDFs whether your sharing them or receiving them, while Cat explains how to make your keyboard shortcuts even more convenient. There's never been a better time to see how your PC can make your life easier than ever!

Graham Barlow

Editor-in-chief

graham.barlow@futurenet.com

Full listing...

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Your guide Nick Peers says...

"Keep unwanted programs off your PC with the help of two free tools"

Turn to page 36 for more



Our promise to you...

Get more from Windows, software and all your favourite sites

Packed with informative tutorials

✓ Every issue, we guarantee to pack the magazine with great tutorials teaching you all the best things you can do with your PC. Each article features step-by-step instructions to make learning new skills fast and enjoyable.

Customise Windows to work your way

✓ We all know how to do the basics but getting the most from Windows isn't always easy. Our dedication to the operating system means you get the very best tips and tricks for all versions of Windows.

Get more from your favourite websites

✓ We all have our list of favourite sites but often we miss out on great features because they're difficult to use or hidden from sight. We'll show you how to do more online, for a more satisfying web life.

Use our full software to try new things

✓ From speed-up and security software to superb photo apps, there's always something new to try on your PC. The Windows Store in Windows 10 and Windows 8.1 is packed with software to download.



Learn how to...

Transform PDF documents



Your guide *Matt Hanson* says...

"We've got an exclusive version of PDF Transformer+ that will make files smarter and easier to share"

At a glance...

SKILL LEVEL

- ▶ Anyone can do it
- Straightforward
- Tricky in parts

TIME TAKEN

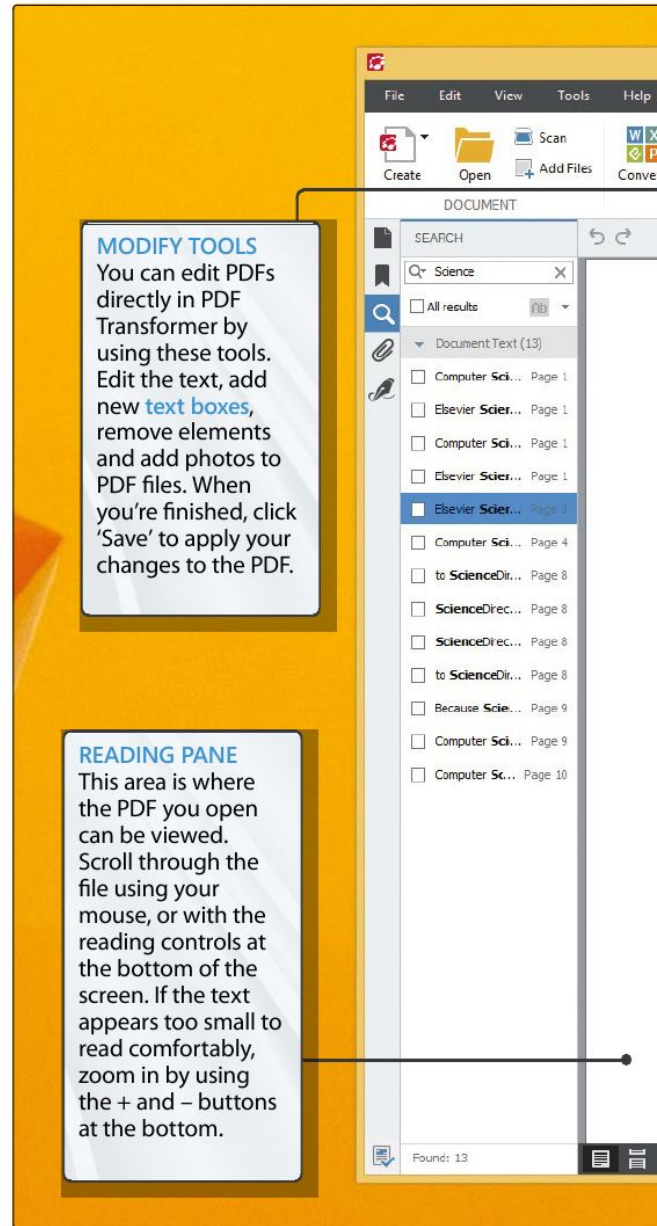
- ▶ **10** minutes

SUITABLE FOR

- Windows 8.1
- Windows 7
- Windows Vista
- Windows XP

Portable Document Format (PDF) files are incredibly versatile, as they allow people to share high-quality text and image documents easily. They're lightweight, yet still look great, which makes them perfect for the internet or saving to a USB drive. Although tools for viewing PDF files are free, most programs that let you create, edit and share PDF files can be expensive, but we've got a special version of the excellent application PDF Transformer+ for *Windows Help and Advice* readers that will make PDF files even more useful.

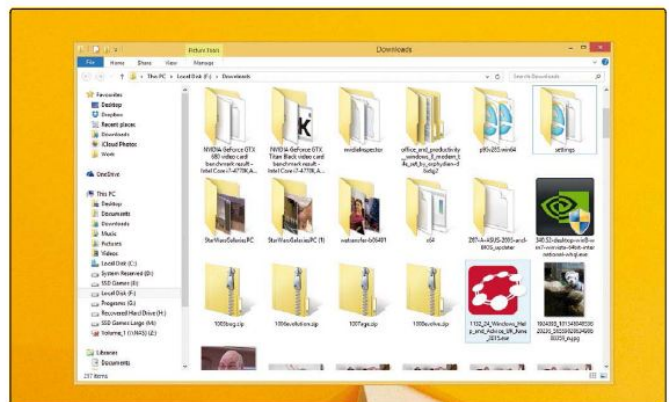
Best of all this version is free, and there's also a 30-day trial of some of its more powerful features that will give you a taste of what it can offer. After the trial you're free to continue using the base program, but if you like what you've seen of the other features, you can buy access to them for a very reasonable price.



Step-by-step | Get the most out of PDF Transformer+



1 **Download PDF Transformer+**
Our readers can download a special version of PDF Transformer+ from www.abbyy.com/PDF-Transformer/WindowsHelpAndAdvice-UK (available until October 3rd). Type that address into your web browser to download. Instead of a webpage appearing, a box will ask if you want to Run or Save the file. Click 'Run' to download and begin installation.



2 **Start the installation of PDF Transformer+**
If you selected 'Run' then PDF Transformer+ will download and the installation process will begin. If you selected 'Save', or 'Download' on some web browsers, then you need to go to location that you saved the file in. Look for a file called '1132_24_Windows_Help_and_Advice_UK_June_2015.exe' and double-click it to begin the installation process.

Jargon buster!

PDF

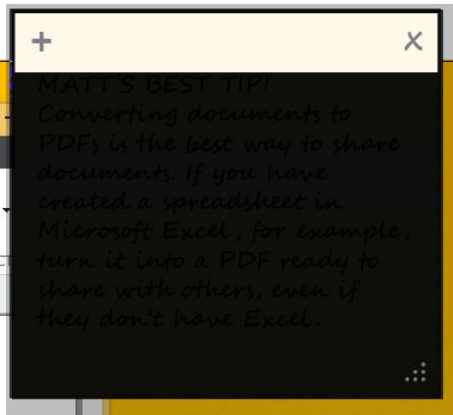
PDF stands for Portable Document Format, and is a popular file type on the internet. It's compatible with many programs and operating systems, so people usually have no problem opening and reading PDF files on PCs.

OCR

OCR stands for Optical Character Recognition, and allows programs to identify characters in non-editable text. For example, you could scan in a page written on a typewriter, and OCR technology would read and understand the text, allowing you to search for words and even edit.

Text box

These square elements in programs allow you to enter in text. They are often used with the search functions of applications, where you type the word or phrase you want to search for into the text box.

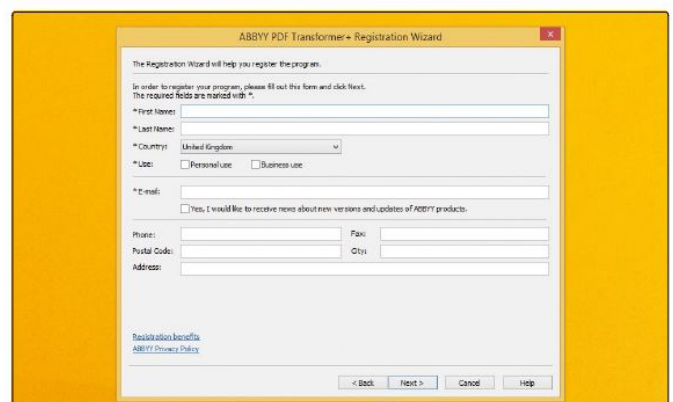
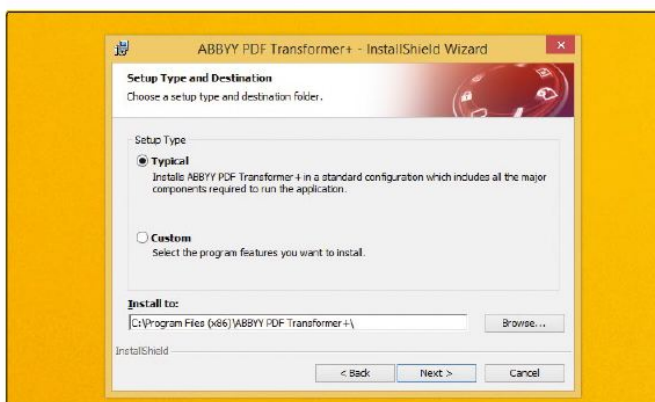
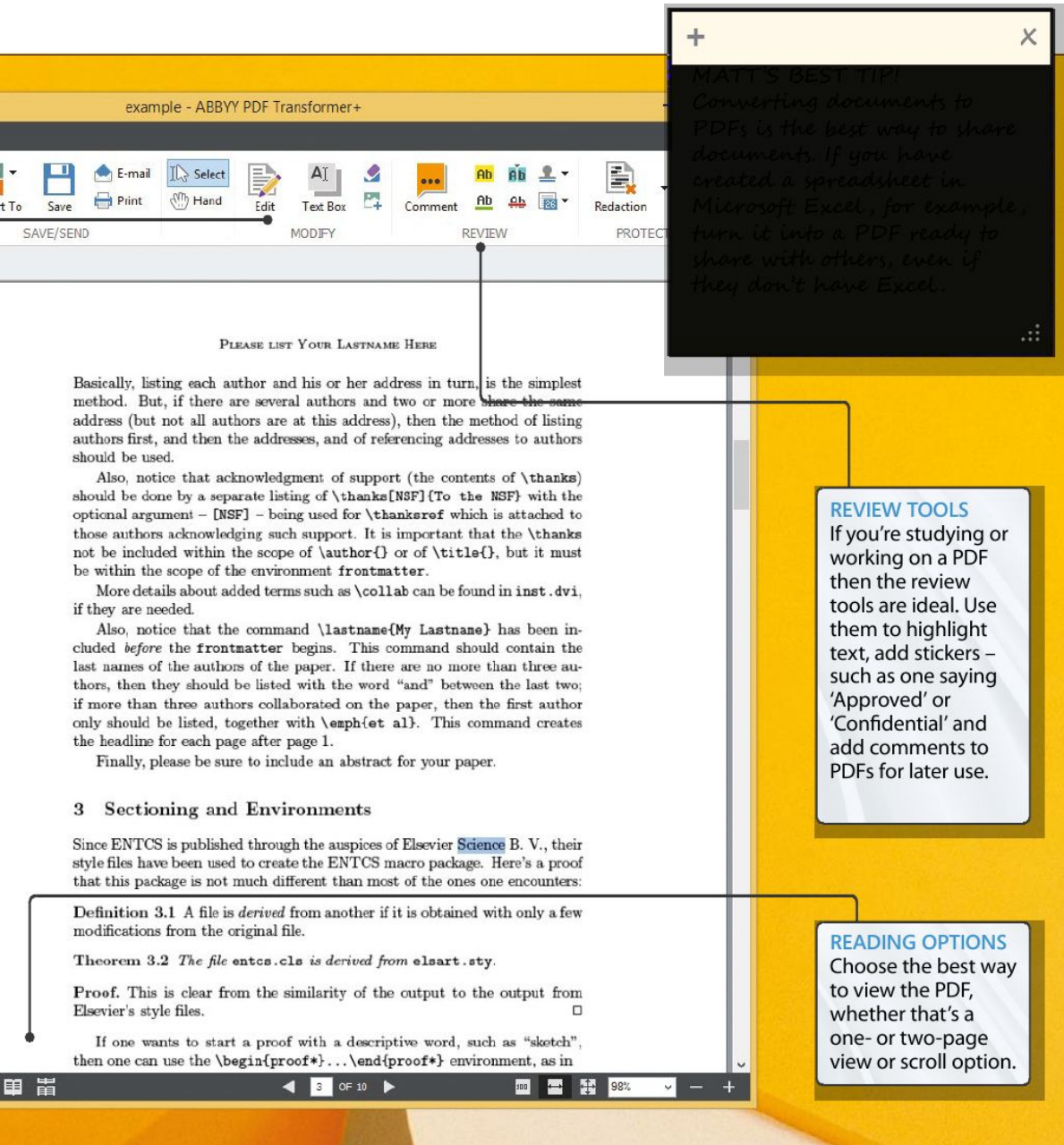


REVIEW TOOLS

If you're studying or working on a PDF then the review tools are ideal. Use them to highlight text, add stickers – such as one saying 'Approved' or 'Confidential' and add comments to PDFs for later use.

READING OPTIONS

Choose the best way to view the PDF, whether that's a one- or two-page view or scroll option.

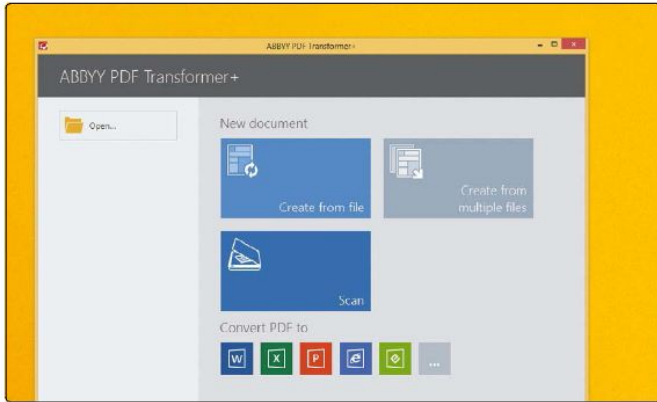


3 Install PDF Transformer+

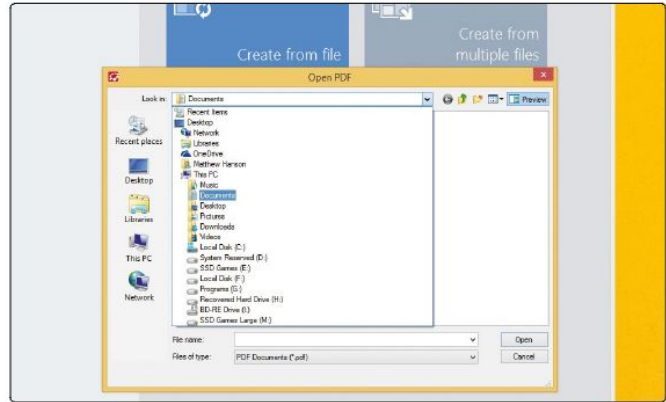
The first screen will ask you where you want to temporarily store the installation files. Leave as default and click 'Install', then you'll be asked if you want to allow the program to make changes. Click 'Yes', then press 'OK'. Click 'Next' after the licence agreement. Now choose the installation type (leave it as 'Typical'), and the location to install. Click 'Next' and then 'Install'.

4 Begin using PDF Transformer+

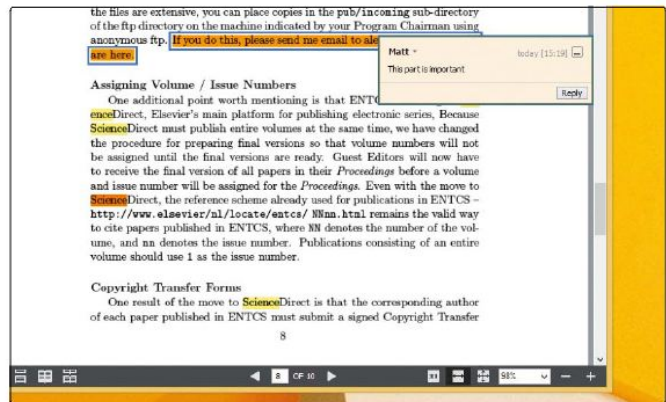
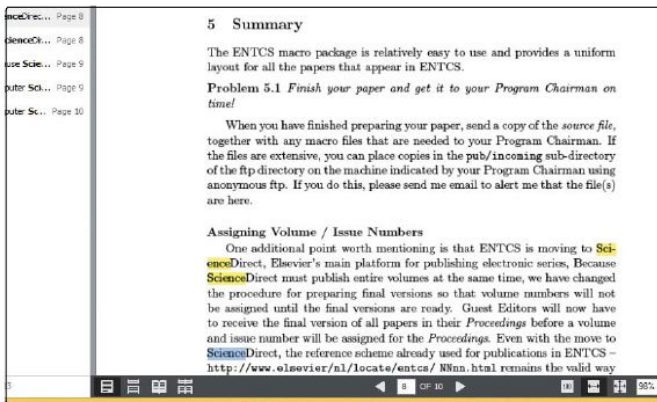
When you first load up PDF Transformer+ you'll be asked to activate a trial licence, or buy one. Click 'Activate Trial Licence', then on the next screen just click 'Next'. Fill out the registration details in the next window, then click 'Next', and then 'Next' again on the following window. Finally, you'll be told the registration was successfully completed, so click 'Finish'.



5 Getting started
 When you load up PDF Transformer+ you might be asked to download and install an update file, so do that first. You may also be asked to make PDF Transformer+ your default PDF viewer. If you're going to be using this program a lot, then click 'Yes'. You'll now see the main screen of PDF Viewer+, which is where you can start opening, creating and editing PDF files.

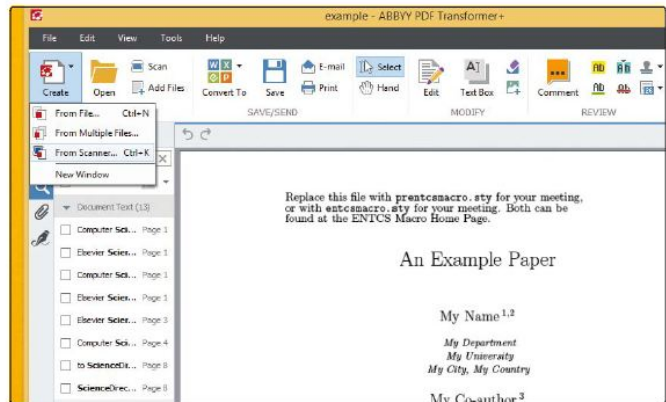
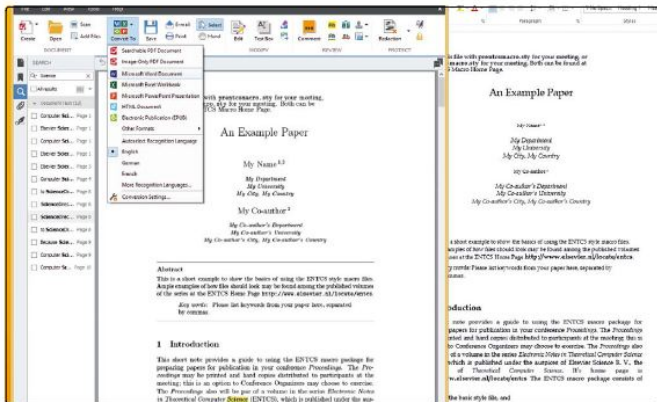


6 Open a PDF
 To open a PDF, click 'Open', then browse to the PDF you want to load. If you've set PDF Transformer+ as the default PDF viewer, you can double-click a PDF file to open it in the program. Once loaded, you can read the PDF by scrolling. You can also use the Pages toolbar on the left to jump to a page, or use the toolbar at the bottom to scroll through or jump to pages.



7 Search the PDF
 PDF Transformer+ has a powerful OCR feature that can allow you to search for words in a PDF file. This is great for finding words or phrases in large PDF files. Click the Magnifying glass icon on the left-hand side of the window, type the word into the text box and press [Enter]. Every page that contains the word will be listed. Click the page to jump to it.

8 Add comments
 You can add comments to PDFs, which is helpful if you're studying, want to take notes or highlight parts of the text for someone else. To add a comment, select the text you want by clicking and dragging your mouse to highlight it, then click the 'Comment' button on the toolbar at the top, and write in your notes.



9 Convert the PDF
 One of the most helpful features of PDF Transformer+ is you can easily convert the PDF into another file. For example, you can convert a text-heavy PDF file into a Word document, so you can edit it in Microsoft Word. To do this, click the 'Convert To' button, then select the document type you want to change it to.

10 Create a new PDF
 If you want to create a new PDF, click the 'Create' button and select the method you want. You can turn a file into a PDF by selecting 'From file' then choosing the file you want to convert. This is handy if you want to make sure people can easily open and read any file you create. You can also scan in physical documents and turn them into PDFs by clicking 'From Scanner'.



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Learn how to...

Quickly install your favourite programs



Your guide *Matt Hanson* says...

Wouldn't it be great if you could install all your favourite programs with a click of a button? With Ninite you can do just that!

At a glance...

SKILL LEVEL

▶ Anyone can do it
Straightforward
Tricky in parts

TIME TAKEN

▶ 5 mins

SUITABLE FOR

- Windows 8.1
- Windows 7
- Windows Vista
- Windows XP

Most of us have a long list of programs we use every day as well as apps we can't live without. However, when you move to a new PC, or you need to format and reinstall Windows on your existing machine, installing your programs again can be an arduous task.

Not only do you have to go to each program's website to download the latest version of the app, but many installers have multiple screens and ask a lot of questions, which makes installation even longer.

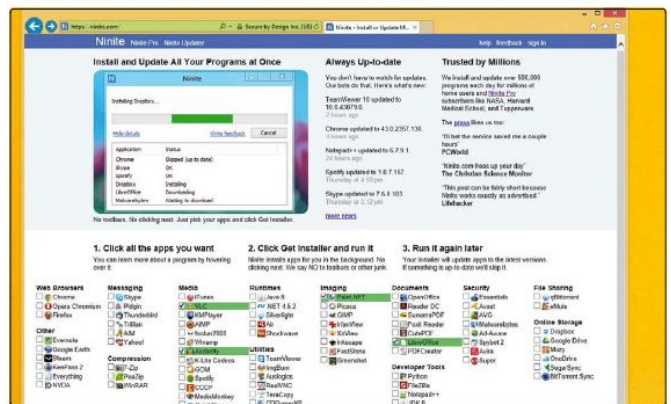
The good news is there's a way to quickly install multiple programs at once. Ninite is a fantastic service that lets you select all the programs you want to install, and then will download, install and configure the programs automatically, so you don't need to hang around and watch a blue bar slowly crawl across the screen. And even better, Ninite is completely free!



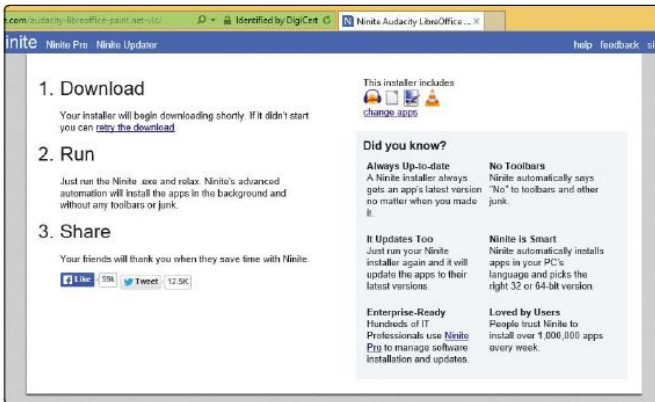
Step-by-step | Install your favourite programs with Ninite



1 Visit the website
Ninite isn't actually a program that you install on your PC. All you need to do to begin using it is visit the website. Open your web browser and go to <https://ninite.com>. This will bring up the homepage, and it's where you can start finding out how much time Ninite will save you.



2 Choose your programs
On the homepage you'll see a list of programs that you can get Ninite to install for you. There's loads to choose from, so to make things easier, the programs are divided into categories. For example iTunes and Spotify can be found under 'Media', while Picasa and Paint.NET are located under 'Imaging'. To select a program to install, click the box next to its name.



3 Get the installer

After selecting the programs you want to install, click the big green button labelled 'Get Installer'. This will take you to a new web page, which will start the download automatically. Click 'Run' to download and run the Ninite installer. Windows might pop up a dialogue box asking if you want to run the program, so click 'Yes', as it's completely safe.



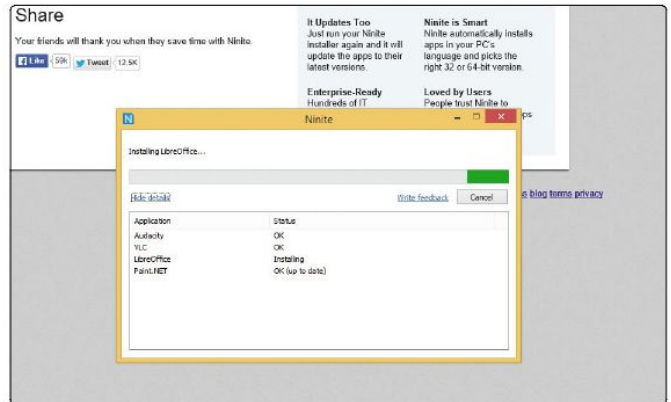
5 Check your installation

During or after the installation you can see what's being installed and updated by clicking 'Show details'. Once the installation has completed, if anything failed to install, click 'Get help on failed or skipped applications'. This takes you to a webpage that lists common errors, along with steps to fix them. You can also click 'retry/re-install' to attempt the installation again.



7 Go pro

If you have a number of PCs you want to install programs on and keep updated, then it's worth considering Ninite Pro. This lets you download, install and manage applications on any PC you own, and it gives you more control over how each app is installed. It also comes with more apps and costs \$20 a month (around £12.60). You can find out more at <https://ninite.com/pro>.



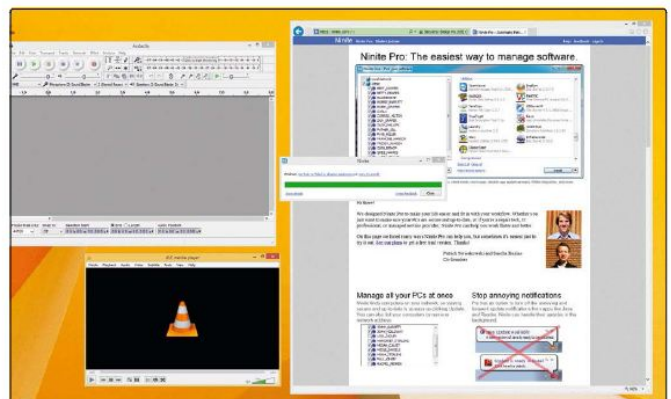
4 Let Ninite Run

In this step you don't really need to do anything. The Ninite installer will now automatically download and install the programs you selected. If you already have a program installed, Ninite will check to see if you have the latest version. If you don't, it will download and install a new version, but if you're up to date Ninite will skip it and move on to the next one.



6 Suggest an app to install

Ninite has a wide range of some of the most popular programs in the world, but it's inevitable that some won't be included. If there's an app you want to use with Ninite but it's not in the list, you can recommend for it to be included in the future. Go to the home page at ninite.com, and at the bottom you'll find 'Suggest an app'.



8 Enjoy your new programs

That's it, you've now successfully installed your favourite programs with just a few easy clicks! You can now rest easy that if you ever get a new PC, or reinstall Windows, you can get your programs up and running without any problems. Ninite does a great job at making sure that no unwanted programs – like toolbars – are installed, so your PC will remain clutter free. ■



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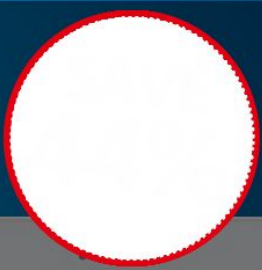
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Learn how to...

Back up your emails



Your guide *Nick Peers* says...

"Create easily recoverable backups of your email and browser settings with the help of KLS Mail Backup."

At a glance...

SKILL LEVEL

- Anyone can do it
- Straightforward
- Tricky in parts

TIME TAKEN

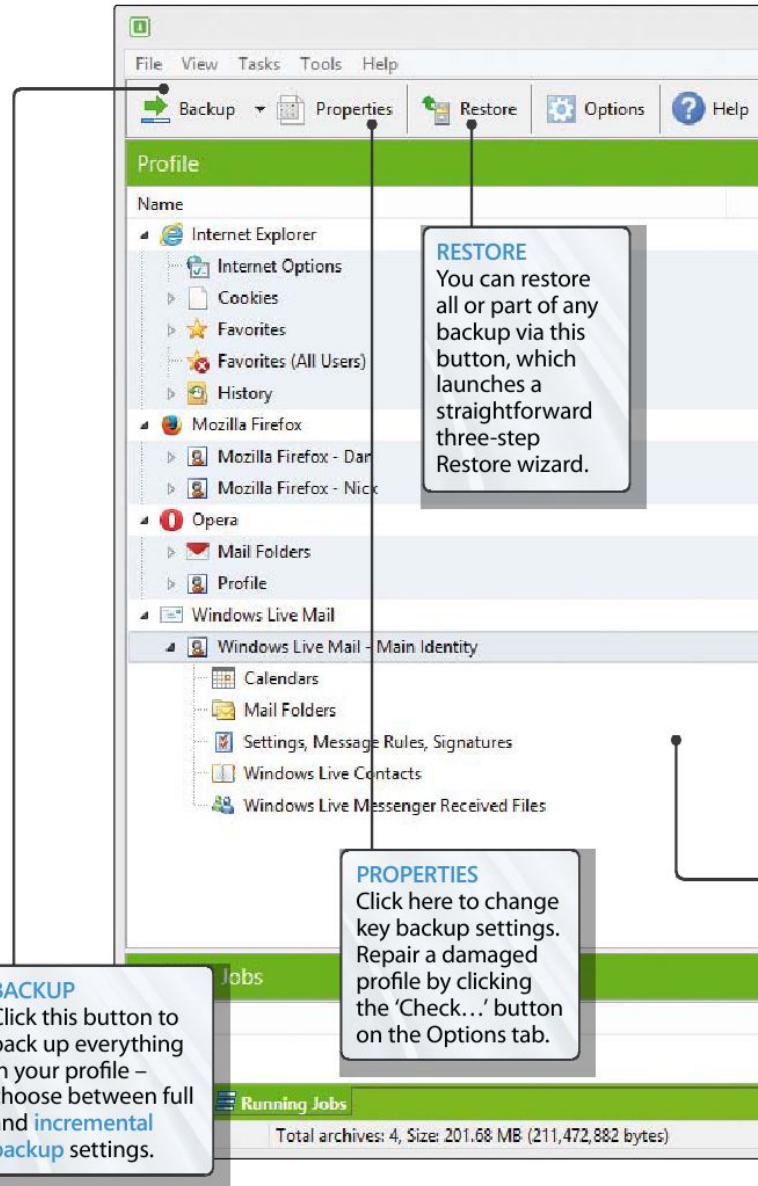
- 20 minutes

SUITABLE FOR

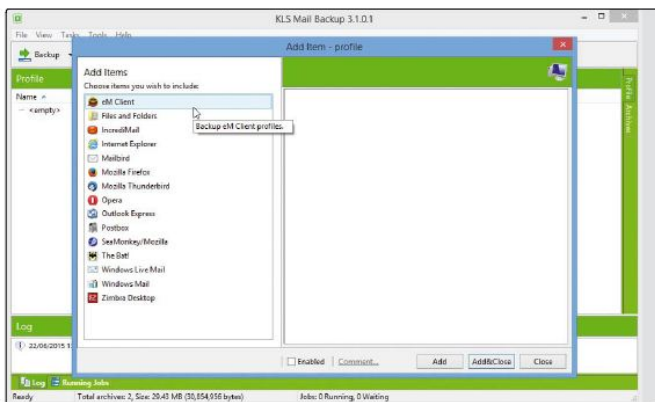
- Windows 8.1
- Windows 7
- Windows Vista
- Windows XP

You shouldn't need reminding how important backups are – just ask anyone who has lost documents, photos or other files. Windows is pretty good at keeping your files backed up, but it never hurts to have multiple backup strategies in place to minimise the risk of data loss. This is where KLS Mail Backup comes in.

The free program allows you to selectively back up both email and browser settings for a wide range of programs, including Outlook Express, Windows Live Mail, Thunderbird, Internet Explorer, Firefox and Opera. This gives you the security of a secondary backup for your email and browser, as well as a quick and convenient way of restoring email, bookmarks or other key settings should you ever need to. Our step-by-step guide shows you how to get started with backup and restore.

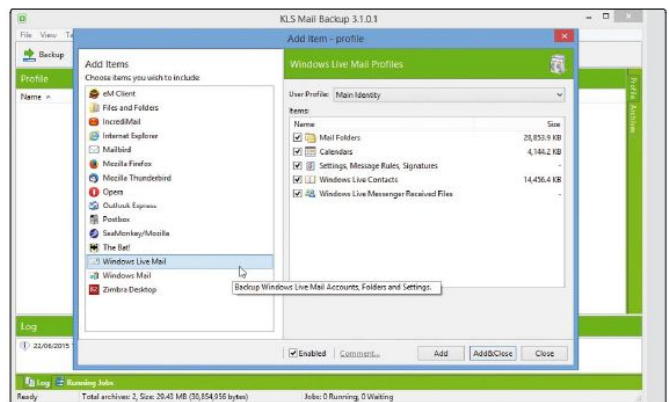


Step-by-step | Protect your email with KLS Mail Backup



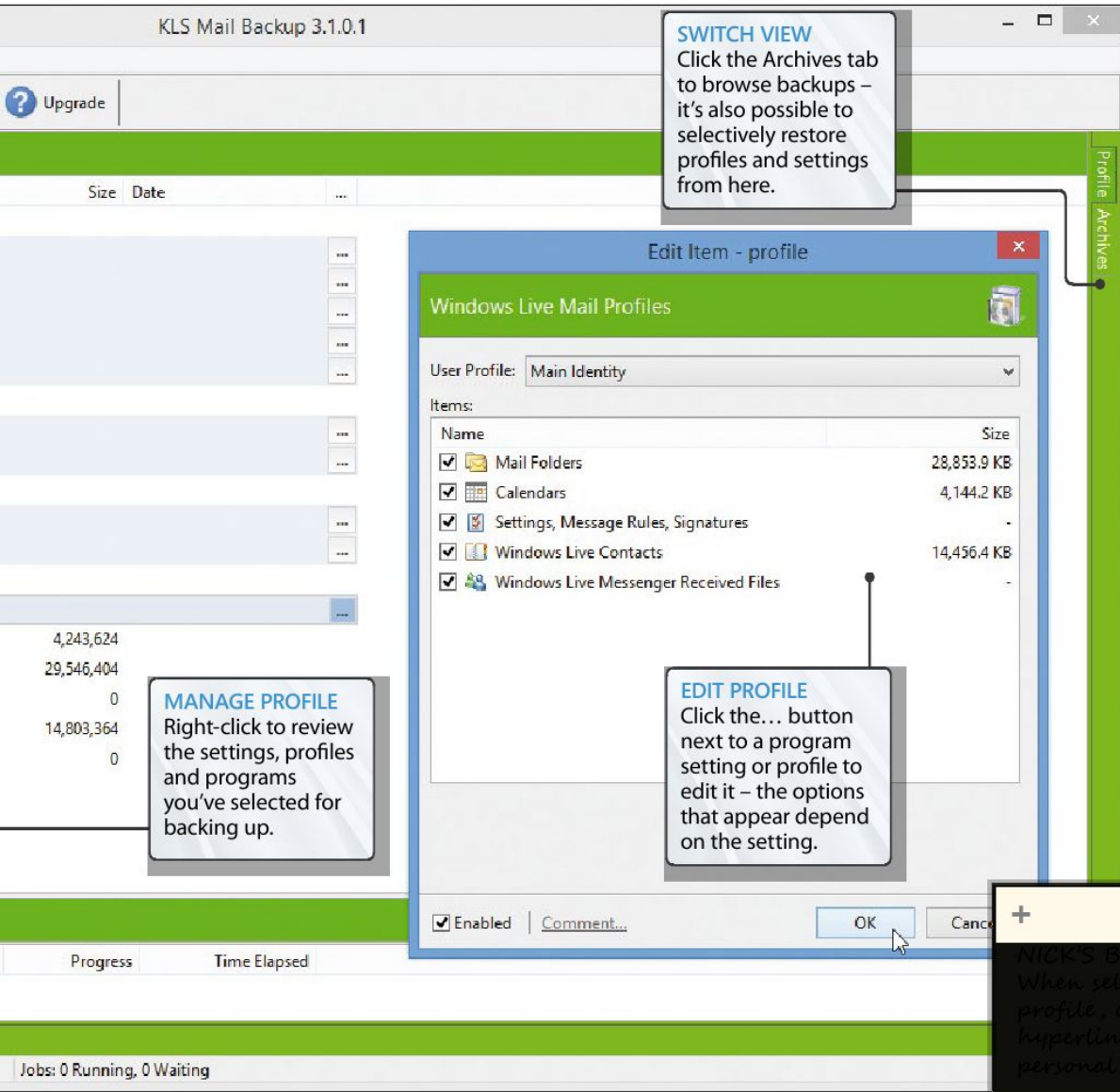
1 Get your tools

You can download KLS Mail Backup from kls-soft.com/klsmailbackup. Run the installer, leave 'Launch KLS Mail Backup' ticked and click 'Next' to launch it. You'll first be prompted to choose which items to choose in your profile, so click 'OK' to get started. A list of supported browsers and email clients will appear in the left-hand pane – click one to view it.



2 Select first program

If the selected program is installed – and KLS Mail Backup can detect it – you'll see a list of settings and files to be backed up. You can remove selected settings, but, if in doubt, leave everything ticked. Also click the 'User Profile' menu to see if more than one user profile is present. If it is, each one will need to be selected in turn and backed up separately.



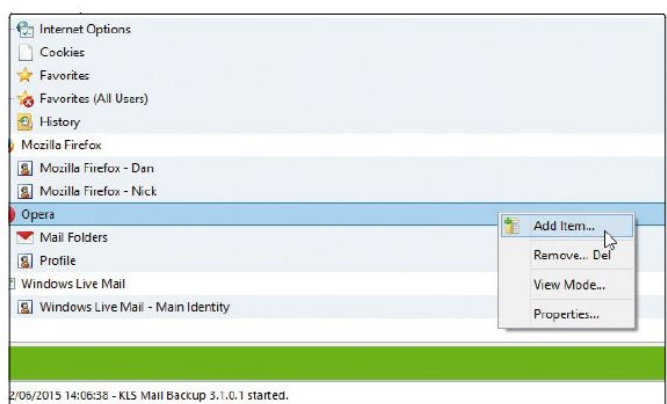
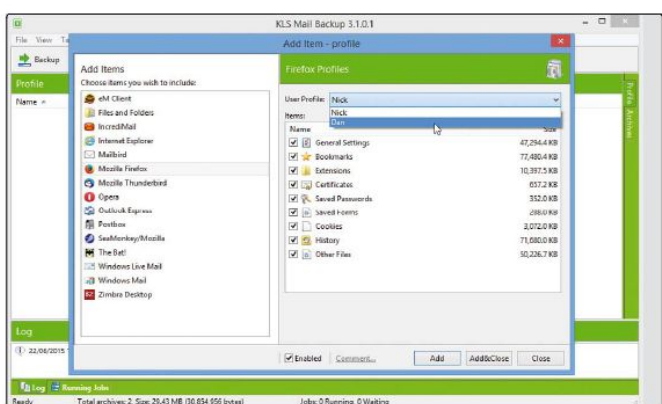
Jargon buster!

CRC32
A form of error-checking – known as a cyclic redundancy check (CRC) – that's incorporated into files in order to verify they're not corrupt.

Profile
A record of the email and browser settings you've selected to back up.

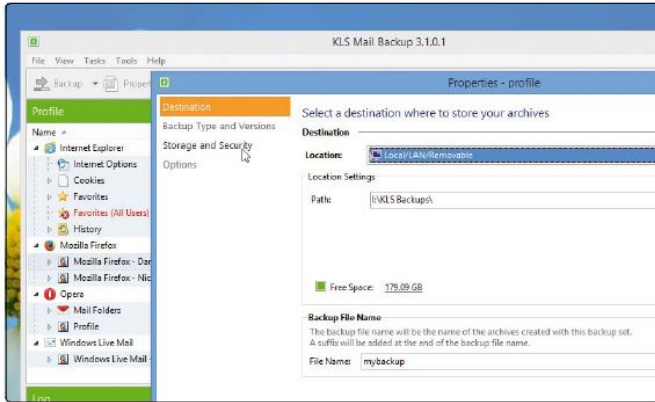
Incremental backup
A backup of files and settings that have changed since the previous backup was taken. When restoring files, both the original full backup and any incremental backups taken since are required.

NICK'S BEST TIP!
When selecting or editing a profile, click the *Comments* hyperlink to add some personal notes to that profile.

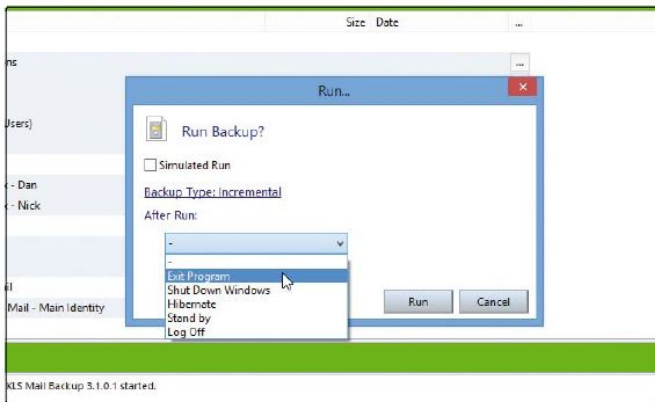


3 Pick profiles
Click 'Add' to select the first program and profile; if necessary, select other profiles for that program in turn via the User Profile dropdown menu and click 'Add' to include them in your backup too. Now move on to the next program. You can back up as many programs and profiles as you wish – including your browser settings. Once you're finished, click 'Close'.

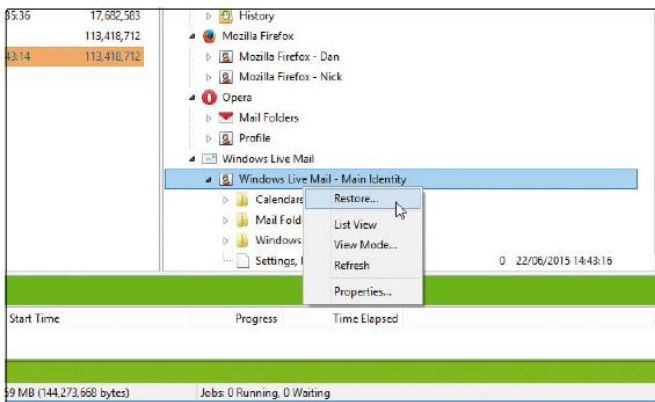
4 Review profile list
After clicking 'Close', a list of selected items for backup will appear in the main KLS Mail Backup window. Click the '...' button to the right of any item to review its contents and make changes. Remove an item from the list by right-clicking it and choosing 'Delete', or choose 'Add Item' to reopen the Add Item dialog in order to add more programs and settings to your backup profile.



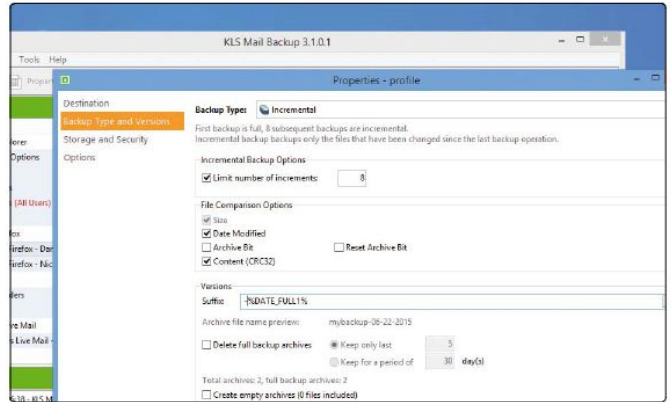
5 Set backup options
Click the 'Properties' button underneath the menu bar. Use the 'Destination' tab to choose a folder on your backup drive where your backups will be stored. You can also replace the default 'mybackup' file name with something more descriptive. Next, select 'Storage and Security' to tweak compression settings – use 'Level' to pick 'Good' or 'Best' for smaller files, for example.



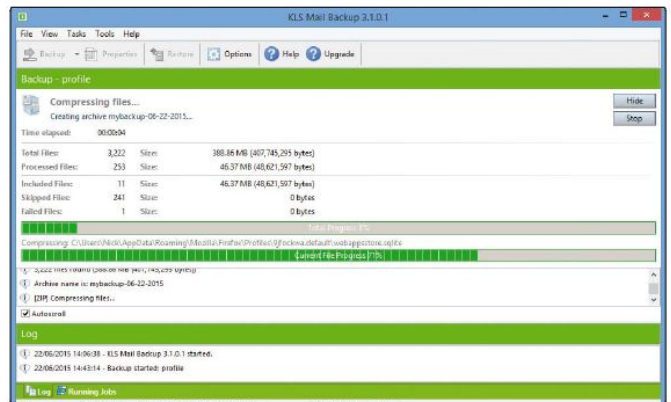
7 Run first backup
Click the 'Backup' button. A summary will be shown – tick 'Simulated Run' if you'd like to test the backup without actually performing it. Click 'After Run...' to set an option to close the program or go further (such as shutting down, hibernating or restarting) once the backup completes. Click 'Run' to perform the backup – if necessary, allow KLS to close any affected programs.



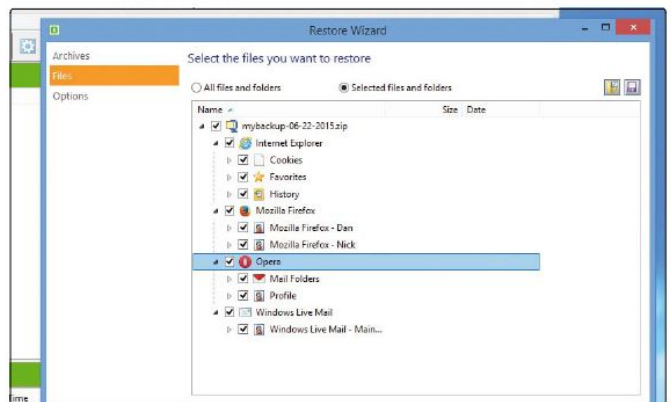
9 Browse backup
Once you return to the main screen, switch to the 'Archives' view using the green tab on the right-hand side of the main window. You'll see a list of available backups in the left-hand window. Double-click one and its contents will appear on the right. You can browse the contents and recover individual files or settings if necessary by right-clicking them and choosing 'Restore'.



6 Set incremental backup
Next, switch to the 'Backup Type and Versions' tab. To maximise disk space, choose 'Incremental'; this creates a full backup, then backs up changes going forward. You can limit the number of versions stored, plus set more sophisticated file comparison options, which may slow the backup process – choose 'Content (CRC32)' to do so. Click Save when 'done'.



8 Verify backup
Wait while the backup is taken – once complete, if you see a message about warnings or errors, click the 'View full log...' button where these will be clearly coloured in orange or red in the log file. In most cases these shouldn't affect the rest of the backup. The backup's integrity is automatically checked after the backup is taken, so all that's left to do is click 'Close' to finish.



10 Backup and restore
Going forward, KLS Mail Backup doesn't run on a schedule, so you'll need to back up manually by launching the program and clicking 'Backup' again. Should you ever need to restore anything from a backup, open the program and click 'Restore' to follow the simple three-step wizard: you can recover all or selected items from any backup you've previously taken with just a few clicks.

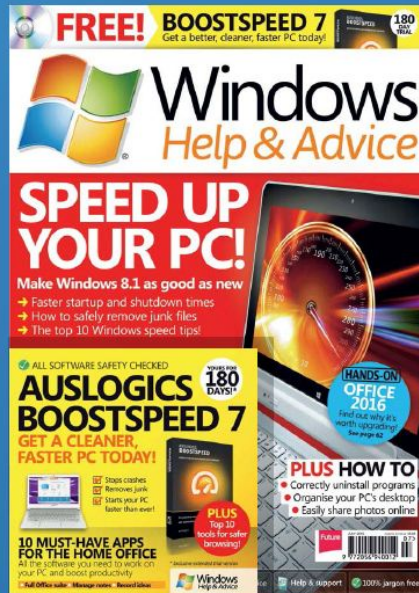
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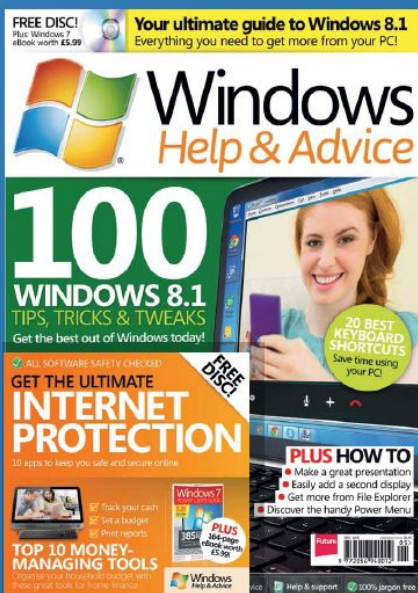
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Learn how to...

Block unwanted apps and toolbars



Your guide *Nick Peers* says...

“Potentially unwanted programs and toolbars are a threat to both privacy and security – keep them off your PC with the help of two free security tools.”

At a glance...

SKILL LEVEL

- ▶ Anyone can do it
- Straightforward
- Tricky in parts

TIME TAKEN

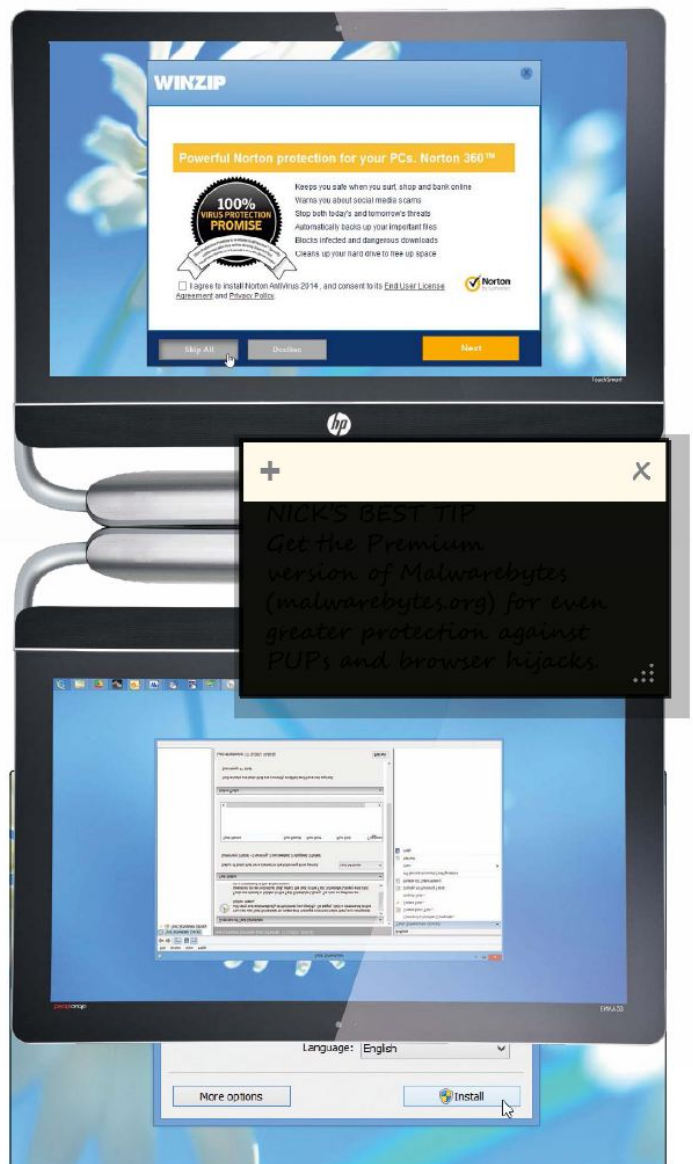
- ▶ 15 minutes

SUITABLE FOR

- Windows 8.1
- Windows 7
- Windows Vista
- Windows XP

Malware comes in many disguises. Potentially unwanted programs (PUPs) attempt to sneak onto your system when installing other software or browsing certain websites. While annoying, many security tools ignore them because they're not technically malicious, despite the fact many use deceptive wording to trick their way onto your PC.

Some PUPs are annoying, but easily removed; others, however, can make changes to your system that are hard to reverse. Many are browser toolbars, which attempt to change your homepage and search settings. Security programs are becoming wise to these threats, but they're still letting many through. Thankfully, two free programs provide extra blocks against both PUPs and browser hijacking from other sources. Read on to discover how to use them to make your PC more secure.



Step-by-step | Beef up your PC's security

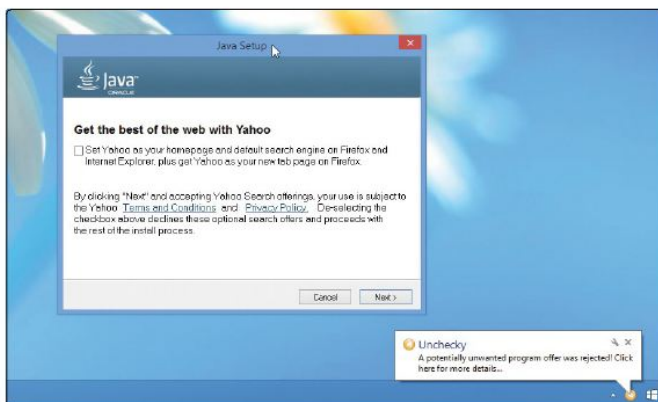


1 How PUPs work

Some download sites and program developers distribute programs inside installers that offer (usually not in a clear way) additional program and toolbar downloads during installation. Look out for these appearing during the set-up – often they're selected for installation by default, accompanied by confusing wording that is designed to trick you into accepting the offer.

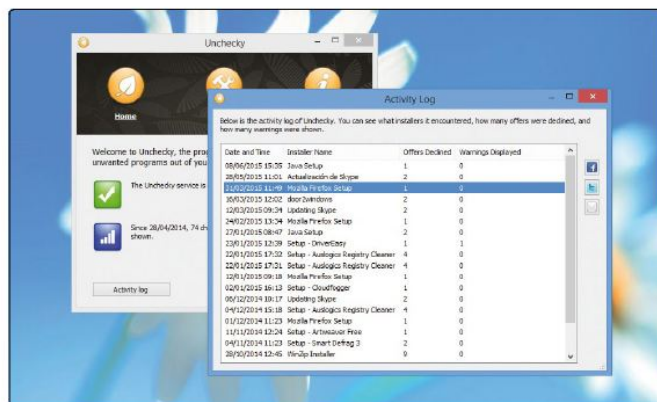
2 Install Unchecky

Unchecky is a free program that spots many PUP installers. Install the program from unchecky.com. When Unchecky detects a PUP, it changes the installer's settings so any options to install potentially unwanted software are unticked. You can still install the software if you wish, but Unchecky will pop up a final warning if you attempt to do so.



3 Unchecky in action

Look for the Unchecky icon in the Taskbar's Notification area and click it to verify the service is up and running. Close the window and Unchecky will silently protect you going forward. Occasionally when installing software containing PUPs you may see a pop-up balloon appear near the Notification area telling you it's doing its work.



4 Review performance

The main window reveals how many checkboxes have been unselected and warnings have been issued since the program was installed on your PC. Click the 'Activity log' button for a complete list of which programs were blocked from installing additional software – including the number of offers declined and the warnings displayed. Now it's time to add more protection.



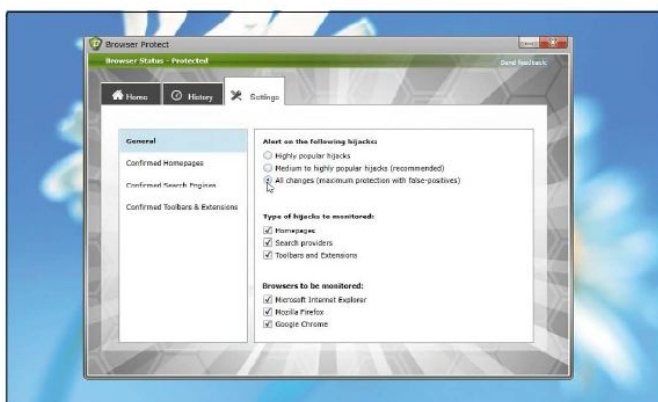
5 Browser Protect

Install Browser Protect Premium from browserprotect.org. This free program monitors Internet Explorer, Firefox and Chrome browsers for potential hijacks of their home pages and search providers, as well as attempts to install potentially unwanted extensions. The program is safe, not to be confused with the Browser Protect malware that trades on its name.



6 Scan and remove

Once installed, the program will open at its configuration page. Start by clicking 'Scan Now' to have Browser Protect scan your browser settings for any potential settings that could be classed as hijacking. Going forward, if any known hijacker attempts to add itself to your browser then Browser Protect will throw up an alerts, allowing you to block (or approve) the actions.



7 Configure protection

Switch to 'Settings' and you can configure Browser Protect further – if you want to manually confirm any changes made to key browser settings, select 'All changes' under 'Alert on the following hijacks' – note the warning about false-positives with this safety-first approach. Advanced users can also manage a whitelist of trusted settings via the 'Confirmed' sections.



8 Enhanced security

While Unchecky or Browser Protect offer protection against hijacking and unwanted programs, they will also filter out many threats that might sneak onto your PC. Both programs are best employed as part of a layered security solution, alongside your main security tool and other useful protection, such as the Web of Trust (mywot.com) plug-in. ■

Learn how to...

Save time using keyboard shortcuts



Your guide *Cat Ellis* says...

"Put the world at your fingertips with quicker and more convenient keyboard shortcuts."

At a glance...

- SKILL LEVEL**
Anyone can do it
Straightforward
▶ Tricky in parts
- TIME TAKEN**
▶ 30 minutes
- SUITABLE FOR**
Windows 8.1
Windows 7
Windows Vista
Windows XP

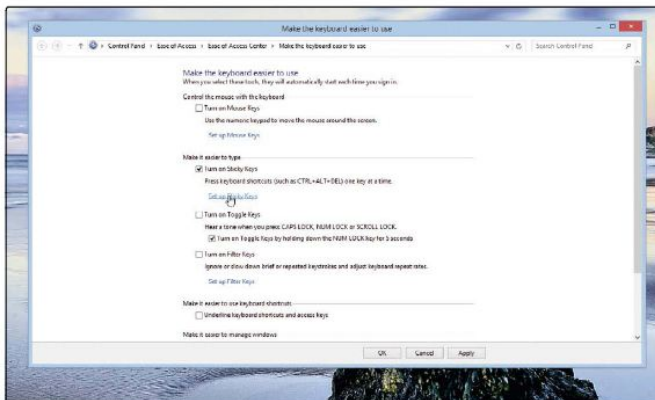
You might have stumbled across the StickyKeys function by accidentally tapping the [Shift] key five times (easily done when playing a game) and dismissed the pop-up window without a second thought. But this feature can be very useful, making multi-key shortcuts easier to use and saving you time.

StickyKeys a built-in accessibility options in Windows. It takes the hassle out of multiple-key shortcuts by letting you tap [Ctrl], [Shift] or [Alt] to toggle it (in the same way that the [Caps Lock] key effectively locks the [Shift] key in Word).

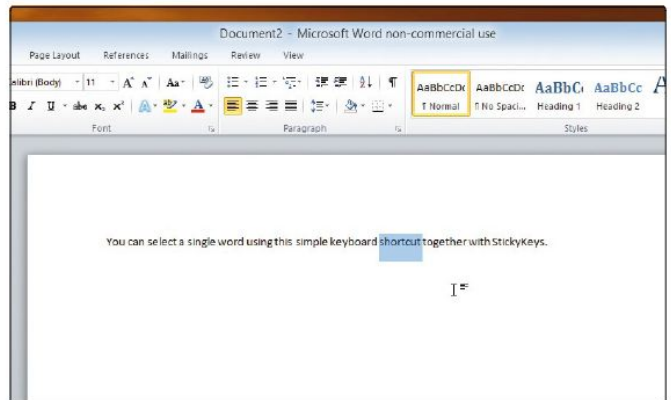
For example, rather than pressing [Ctrl]+[Alt]+[Delete] together to open the Task Manager, just tap each one in turn. This is useful if you're using a small laptop or compact keyboard that only has one of each modifier key, requiring some serious finger-twisting. Let's get started!



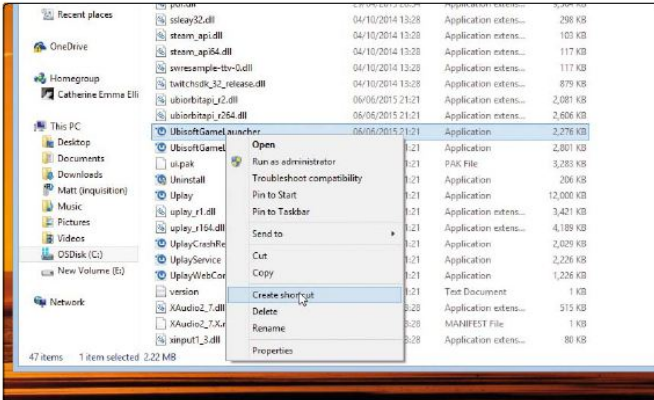
Step-by-step | Simplify shortcuts with StickyKeys



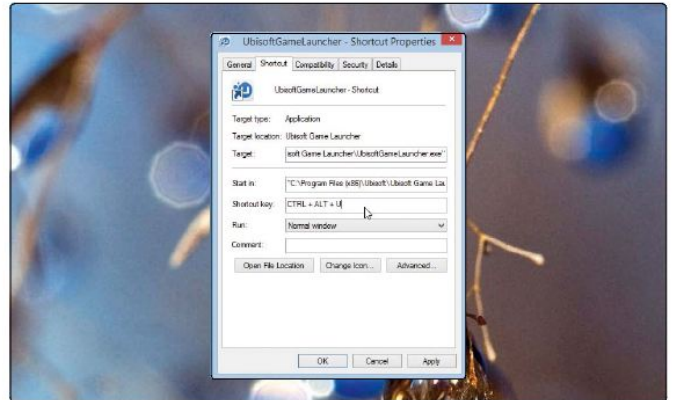
1 Start sticking
From the Start screen, type **StickyKeys**, then press [Enter] to search for it. Select the option 'Change how your keyboard works' and you'll see various options. Click the box marked 'Turn on StickyKeys', then click 'Set up StickyKeys'. You'll need to check the 'Turn on StickyKeys' box again, then select all the options underneath and click 'Apply', then 'OK'.



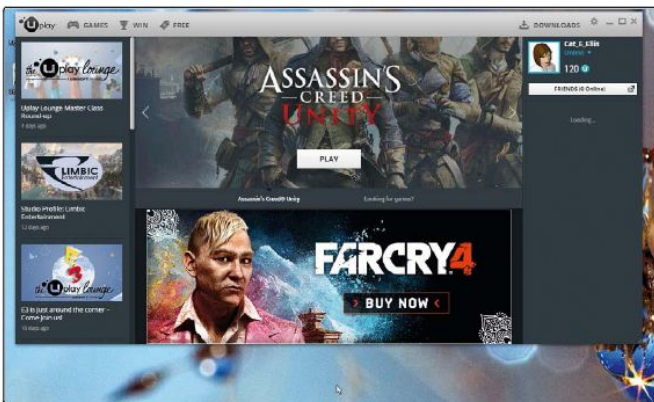
2 Try it out
Test it by tapping [Ctrl], then [Alt], then [Delete]. Easy, isn't it? These shortcuts are particularly useful when you're working on documents in Word. For example, you can tap [Ctrl] then [S] to save, [X] to cut a word, [C] to copy, [V] to paste or [Z] to undo. It's particularly handy for shortcuts that require three keys; to select a single word, tap [Ctrl], then [Shift], then an arrow key.



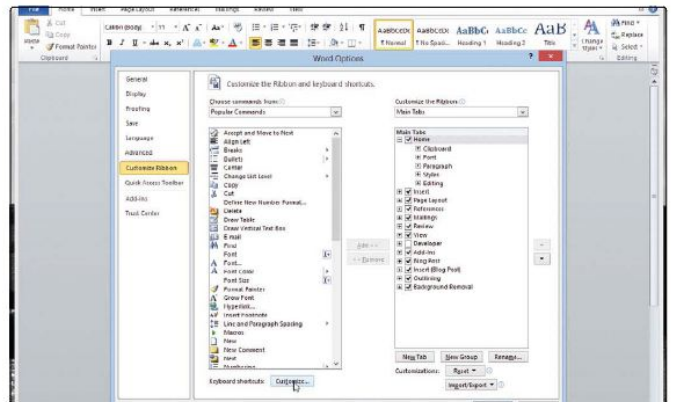
3 Custom combos
Windows' built-in keyboard shortcuts are great (you can find a full list at <http://bit.ly/1GK2F3K>), but to really get the most out of StickyKeys, you can set up your own combinations for the tasks you perform most often. For example, you might want a quick way to open your favourite program. First, open File Explorer, find the program, right-click it and select 'Create shortcut'.



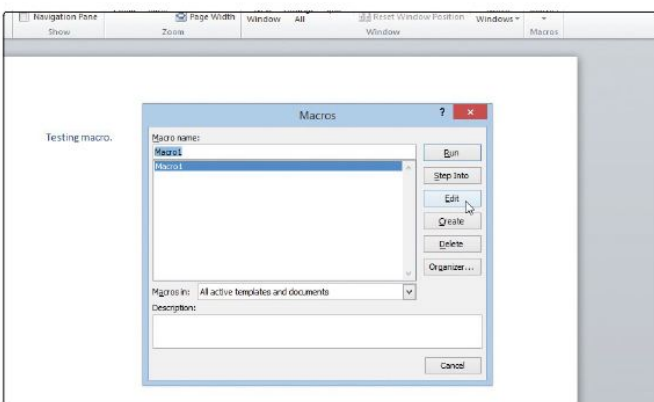
4 Choose your key
Right-click the shortcut and select 'Properties'. Click 'Shortcut key', then tap the button on your keyboard that will be used (together with [Ctrl]+[Alt]) to open the program. If possible, use the first letter of the program's name. You can't use [Esc], [Enter], [Tab], [Space], [Print Screen], [Shift] or [Backspace]. You'll be informed if you choose a key that's already in use.



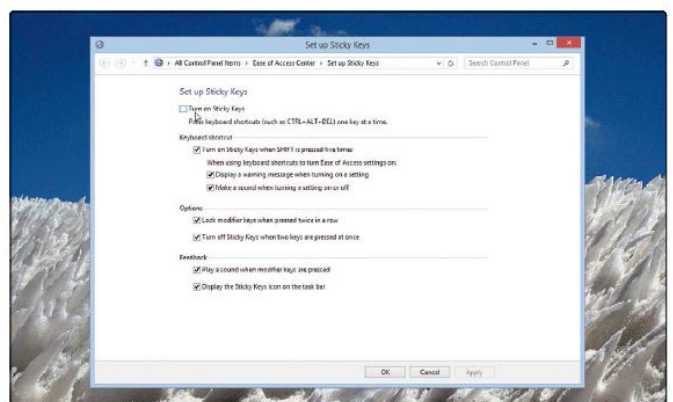
5 Open sesame
Now test it – with StickyKeys activated, tap [Ctrl], then [Alt], then your chosen key and your program will open immediately. Why not try making one for Word – then try making some more custom shortcuts to simplify your daily typing tasks. Right-click the ribbon at the top of the window, then click 'Customize the Ribbon' and select 'Customize' next to 'Keyboard shortcuts'.



6 Magic Word
Select a category (such as 'Home', 'Insert' or 'Review'), then choose an action to perform. Above is a shortcut that will zoom the document to 100 per cent. Click inside the 'Press new shortcut key' box and press the key combination you want to perform that action. As before, Word will tell you if the shortcut you've chosen is already in use, and prompt you to pick something else.



7 Make macros
Click 'OK' and you're ready to try your new shortcut using StickyKeys. Simply tap each of the keys in your custom shortcut to perform your chosen action. If you want to get really advanced, you can record a macro (a kind of small program that performs a series of actions), then assign it to a custom shortcut. Visit <http://bit.ly/1cM4W5H> to find out how to create your own macros.



8 Touch, type, tap
That's it – you can now perform practically any task with a few quick key taps, without tying your fingers in knots in the process. If you decide you want to turn StickyKeys off at any point, simply press [Shift] five times, then open the Ease of Access Center and uncheck the first box. I don't think you'll want to, though! ■

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In this tips guide to Windows 8.1 we reveal all you need to know to get even more from your home PC. We kick off with advice on customising Windows 8.1, then tackle some advanced system tools, before showing you how they can help you discover what's going on with your PC.



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Learn how to...

Control your PC with Twitter



Your guide *Matt Hanson* says...

"Twitter isn't just about following famous people, you can also use it to control your PC remotely!"

At a glance...

SKILL LEVEL

Anyone can do it
Straightforward

Tricky in parts

TIME TAKEN

▶ 15 mins

SUITABLE FOR

- Windows 8.1
- Windows 7
- Windows Vista
- Windows XP

Twitter has taken the world by storm with people sharing their 140-character thoughts with the world. Part of its appeal is its simplicity, but underneath the hood, it's actually a complex and powerful service, and this has allowed services such as TweetMyPC to take advantage and create tools that are a world away from Twitter's original goals.

What's great about TweetMyPC is it lets you remotely control your PC via Twitter. If you're away from home, for instance, and have left your PC on, you can use Twitter to switch it off. All you need to do is send a simple 'shutdown' command through Twitter and your PC will close your programs and shut the PC.

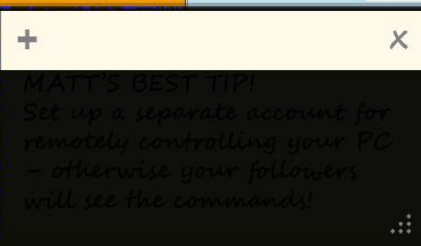
Or if you've forgotten to bring a document, you can **tweet getfile** and the name and location of the file, and your PC will email it to you!

ABOUT

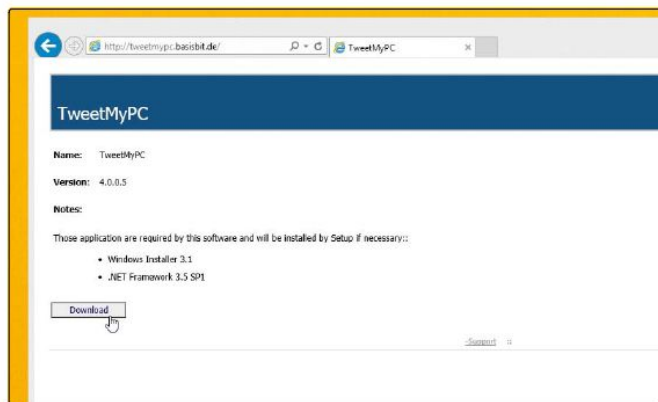
Click this menu option and select 'Basic Command List' to get a list of commands that you can send to your PC with TweetMyPC.

TWEET BOX

This is the part of the Twitter web page where you can type in your tweets. When using TweetMyPC, it's also where you'll type in the commands to send to your PC.

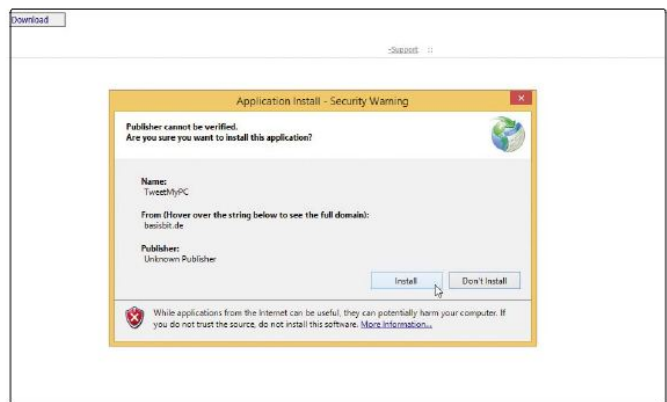


Step-by-step | Control your PC with TweetMyPC



1 Download TweetMyPC

To download the TweetMyPC program, simply visit the website over at <http://tweetmypc.basisbit.de>. You can now click on the 'Download' button at the bottom of the screen. This will begin the download process. Once done, click on 'Run' – or double click the downloaded file – to begin the installation process.



2 Install TweetMyPC

As is the standard procedure, the first step of the installation process will ask you to accept the License Agreement. Assuming you are happy to do so, then just click 'Accept'. TweetMyPC will download some more files. Should a security warning pops up during this action, don't worry, just click 'Install'.

Jargon buster!

Tweets

Tweets are small 140 character messages that you send on Twitter. They can be short descriptions about your day, or with TweetMyPC they can be commands to send to your PC.

Tick box

These small squares sit next to options in Windows and you click them to add or remove a tick. If there's a tick in the box, it means the option is selected.

PIN

To authorise an app with Twitter, the service generates a long string of numbers that you need to copy and paste into TweetMyPC. This makes sure that only you have access to your Twitter account.



TIMELINE

This area is where you'll see yours and other people's tweets. This is a new account, so it is empty for now. However, once your PC has successfully completed a command, TweetMyPC will post here letting you know.

EMAIL SETTINGS

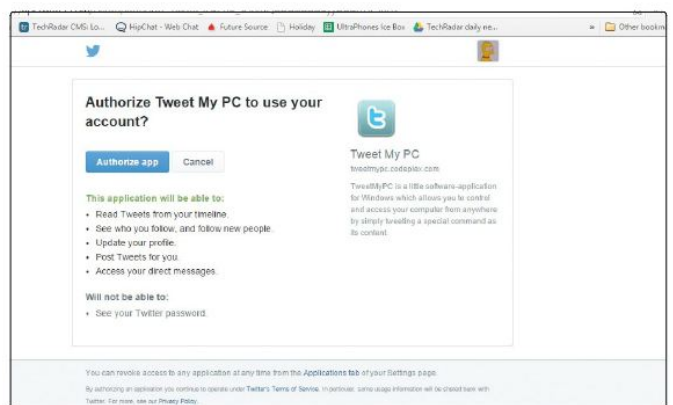
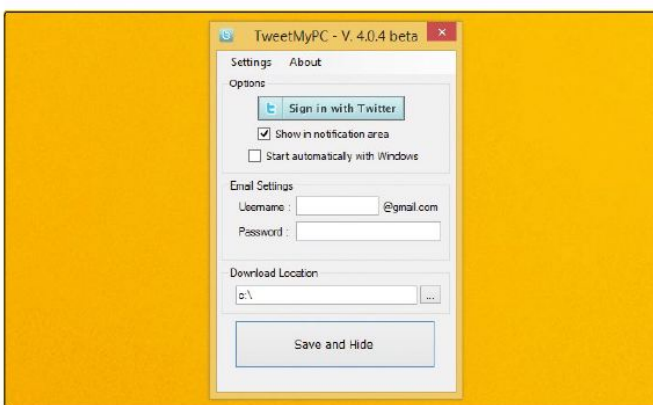
If you want your PC to email you files when you're away from it, enter in your email settings here. It has to be a Gmail account, so if you don't have one you can quickly set one up for free from <https://mail.google.com>.

TWEET BUTTON

Once you've typed the tweet with the command you want to send to your PC, click this blue button to send it. It might take a few moments, but your PC will then receive the command and act accordingly.

PROFILE

This purple icon with the egg silhouette represents your Twitter profile. If you wish, you can change the icon to a photo or picture of your choosing by clicking on it, and selecting 'Settings'. From here you can also alter your privacy settings.

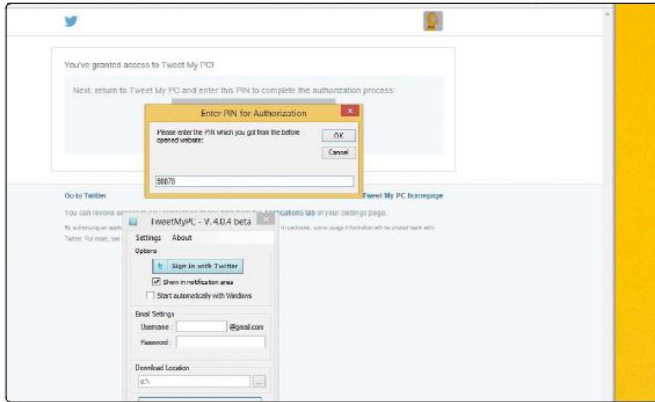


3 Configure TweetMyPC

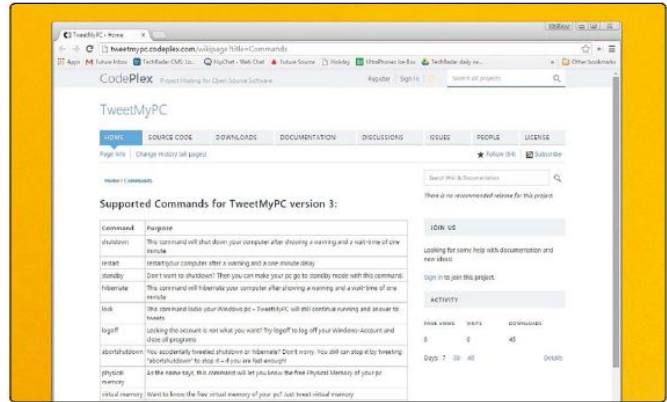
Once installed the configuration settings of TweetMyPC will be displayed, which will allow you to configure the program. The 'Show in notification area' box keeps an icon in the bottom-right hand side of the screen as a reminder that TweetMyPC is running. If you want TweetMyPC to start when you load up Windows, check the **tick box** next to 'Start automatically with Windows'.

4 Connect TweetMyPC to Twitter... part one

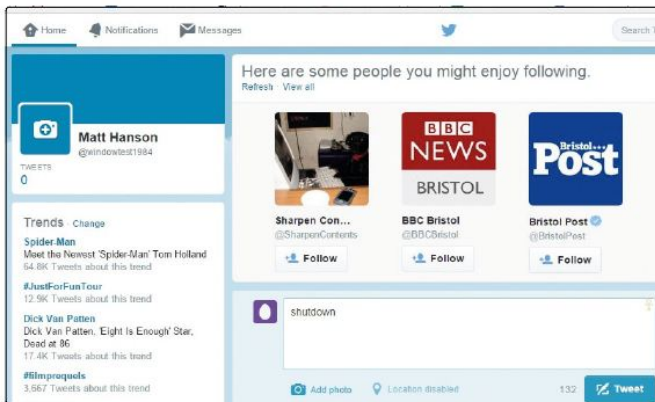
For TweetMyPC to work, you will need to let it access your Twitter account. Simply click the 'Sign in with Twitter' button to begin. A window will then pop up to tell you that the Twitter website will open. Click 'OK' then log into Twitter. If you've already logged in previously, you won't need to log in again.



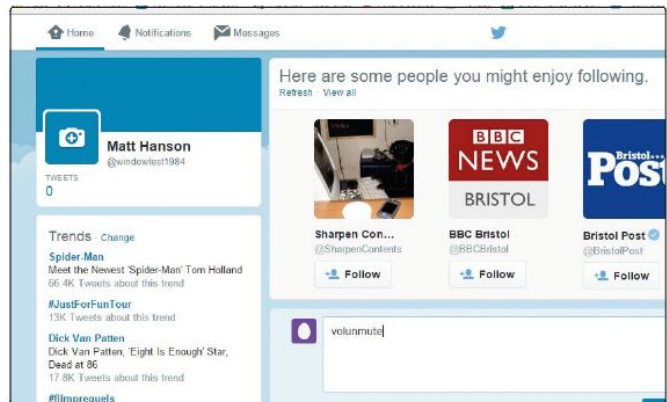
5 Connect TweetMyPC to Twitter... part two
On the page that opens, click 'Authorize app'. It says the app will 'Post Tweets for you' but it won't post anything you don't want it to – it just needs this to send the remote controls to your PC. You'll be given a PIN number to authorise Tweet My PC, so type this into the 'Enter PIN for Authorization' dialogue box.



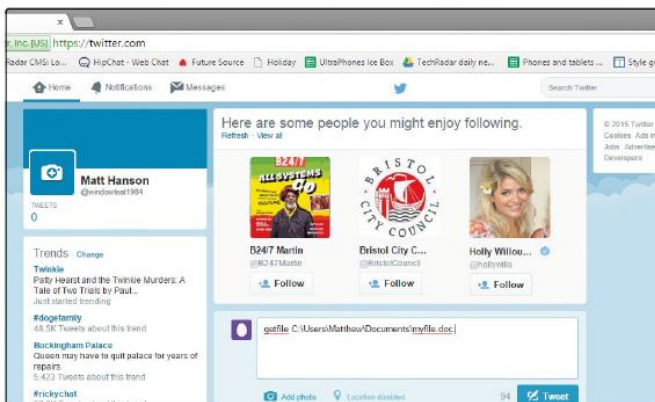
6 Begin using TweetMyPC
Click 'Save and Hide' and you can begin using Tweet My PC. To see a list of commands that you can send to your PC, right-click the icon in the notification area and select 'Edit settings'. When the window appears, click 'About', then select 'Basic Command List' to see a list of commands you can use.



7 Use Twitter to shut down your PC
Go to your Twitter home page and in the text box type **shutdown**. Send the tweet, and a warning will appear on your computer saying it will shut down. It will then wait one minute, and then actually shut down. If you change your mind, tweet **abortshutdown**.



8 Change the volume of your PC
Another great use for TweetMyPC is for controlling your PC when you listen to music or watch films on it. If you want to turn down the volume without going over to your PC, just tweet **voldec**, and to turn it up, tweet **volinc**. To mute the volume tweet **volumute**, and to unmute it, tweet **volumute**.



9 Send files remotely
You can also send files from your PC to your email. To do this, you'll need to know where on your PC you saved the file. Type in **getfilelist** then the drive letter (usually C) to get sent a list of files and their locations. You can then type in **getfile** and the location of your file. For example **getfile C:\Users\Matthew\Documents\myfile.doc**.



10 Keep track of what's going on
You now know the basic functions of TweetMyPC and can use it to remotely control your PC. It can sometimes take a while for the commands to come through, so be patient. Once a command successfully completes, you'll get a tweet telling you what has happened – so you'll know that TweetMyPC is working correctly. ■

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Learn how to...

Boot into Windows faster



Your guide *Christian Hall* says...

"If your PC seems to take an age to start, then follow these time-saving tips to arrive at your Windows desktop more quickly"

At a glance...

- SKILL LEVEL**
Anyone can do it
Straightforward
▶ Tricky in parts
- TIME TAKEN**
▶ 2 hours
- SUITABLE FOR**
Windows 7
Windows Vista
Windows XP

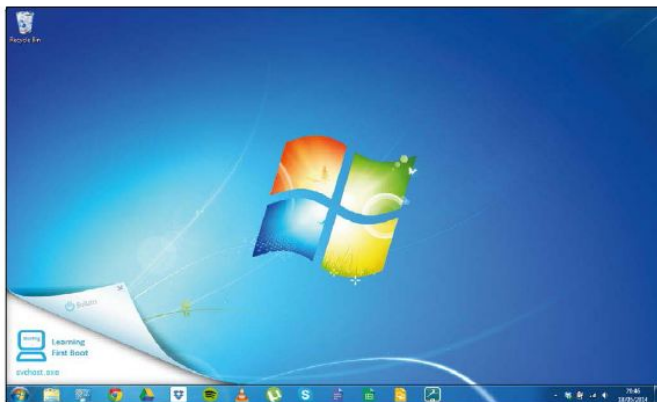
The instant startup is still the holy grail of computer users, and although Windows is getting faster with each new update, it still takes the average PC nearly three minutes to become ready to use. With a few clever tweaks, however, you can shave off valuable seconds, getting your boot times down to barely a minute.

The more programs are on your computer, the more processes are introduced into the startup process. If left unchecked, it will get slower and slower over time as it tries to do more and more things when you press the power button, so this is what we'll concentrate on here.

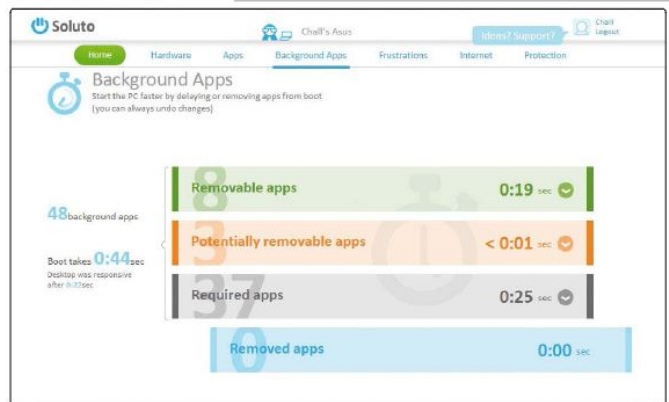
If these tips don't give your system enough of a boost, one of the most effective ways to speed up your PC is to fit a solid-state drive instead of (or in addition to) your standard mechanical hard drive. Visit <http://bit.ly/Tte32u> to find out how to do it.



Step-by-step | Speed up boot times for good!



1 Analyse your boot times
Use the free Soluto cloud service to see how long your boot times are and what programs are the worst offenders at slowing things down. Register at www.soluto.com (click 'Create my free account' on the home page) and then install the Soluto client. You'll be prompted to restart your PC, after which you'll see Soluto running in the bottom left of your desktop.

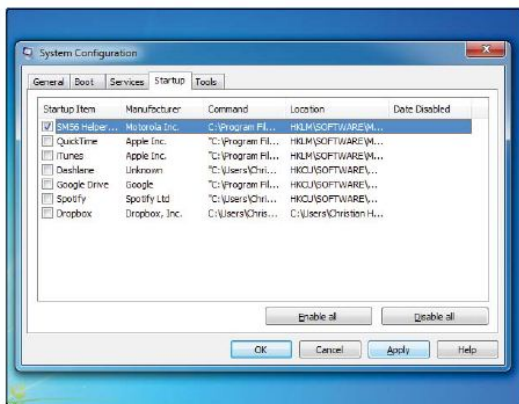


2 What's slowing you down?
Tap 'Take a look' in the bottom left to launch Soluto. This will open your account on the web. Add your first device (Current PC), then click on it in My Devices and scroll down to Background Apps. Here you'll find a summary of the things that contribute to a slow startup. To the left you'll see how long your last boot took and, crucially, how long it took for the desktop to become active.



3 Remove programs
Click one of the program categories to reveal a list of applications and how much time they add to your PC's startup. 'Required apps' are essential Windows processes, so don't delete any of them – look under 'Removable apps' and 'Potentially removable apps' only.

4 Get recommendations
You can't remove programs directly through Solutio, but when you click one, Solutio will tell you what it is and what actions you need to take to either remove it or start it up after your PC has booted. The handy pie chart breaks down the boot behaviour of the program you've highlighted.

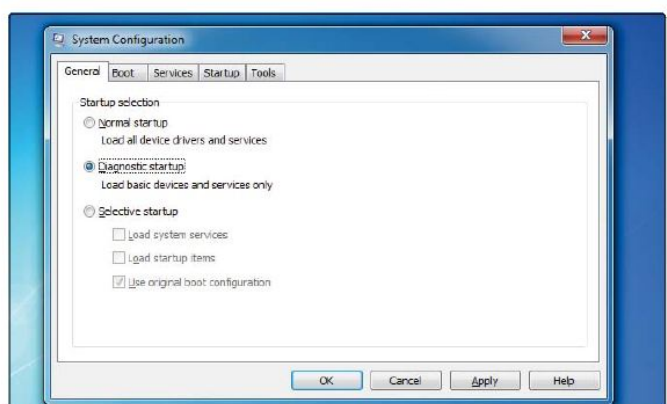
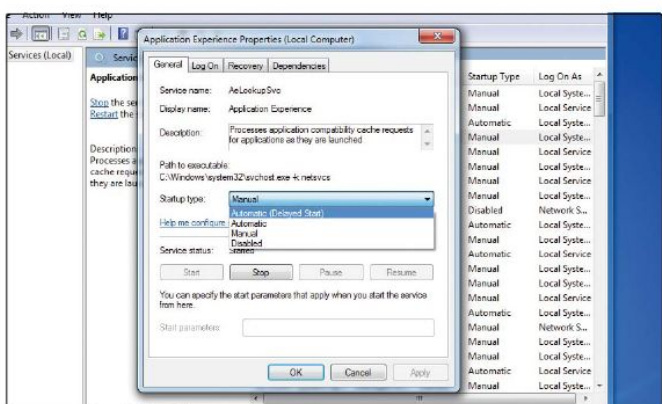


5 Start menu items
One of the best ways to speed up your boot process is to keep unnecessary programs from starting up with your PC. To do this, access **System Configuration** (type `msconfig` in the Start Menu's search box), and go to the Startup tab. Simply uncheck items you don't want and click 'Apply'.

Jargon buster!

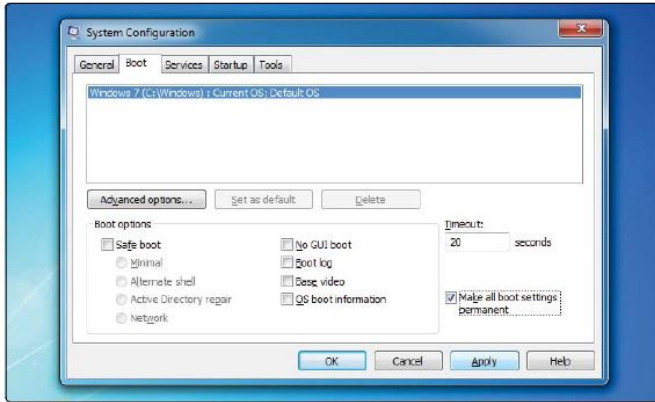
- ▶ Boot device**
The drives your PC will attempt to use to load Windows. The first boot device should be your optical drive if you want to boot from a CD/DVD, but having your HDD first is a little faster.
- ▶ Windows services**
Programs that run in the background, and are controlled by the Service Control Manager.
- ▶ System Configuration**
Also called `msconfig` – a utility that helps you make changes to your PC's startup.

6 Boot priorities
The BIOS is a special setup tool that gives you enormous control over your PC. You can access it by holding a key when you start your PC (this is usually [Delete] or [F2], but may be something else depending on your motherboard). Here you can turn on the Fast or Quick Boot option, which deactivates the tests your computer usually runs when it first turns on. You can also make your hard disk the first **boot device** to save a few seconds.

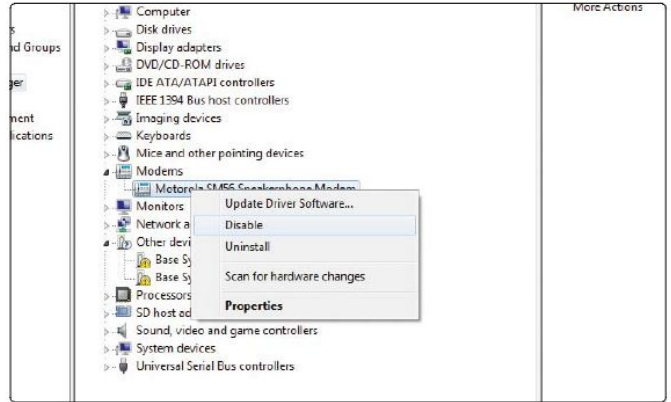


7 Delay Windows services
You can delay certain **Windows services** so that your computer boots quickly, then loads them later when it's up and running. Type `services` into the Start menu's search bar and click on the cog icon labelled 'Services'. Right-click on a service, choose 'Properties' and select 'Automatic (delayed start)' from the Startup Type drop-down menu. Click 'Apply' when you're done.

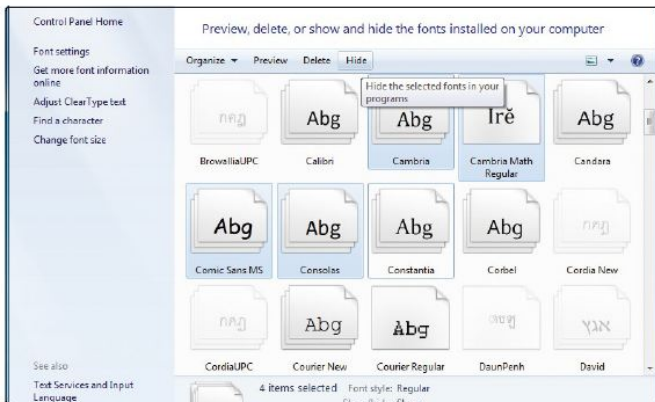
8 Startup choices
The first tab in System Configuration is General, where you can choose one of three options under 'Startup selection'. 'Selective startup' is usually used to determine problem programs that cause crashes, but it can also be used to avoid loading non-essential programs. Choose this option and tick the box for 'Load system services', then click 'Apply'.



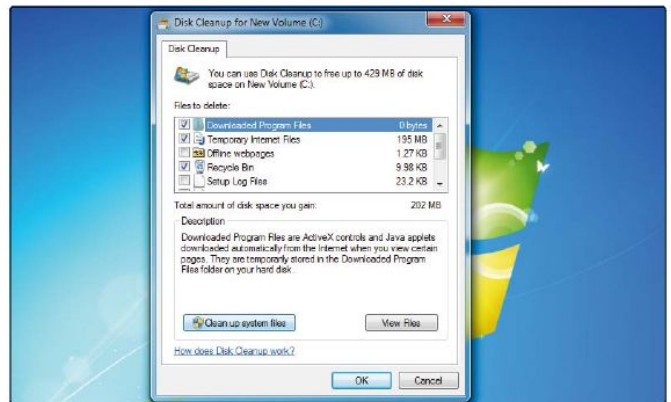
9 Change boot menu timeout
 If you're dual-booting then your boot menu probably has a timeout value. This is how long it will wait for you to make a selection before it just boots into the default operating system. On Windows, this timeout value is usually 30 seconds. To change this timeout value, go to the Boot tab in msconfig, reduce the time, tick 'Make all boot settings permanent' and click 'Apply'.



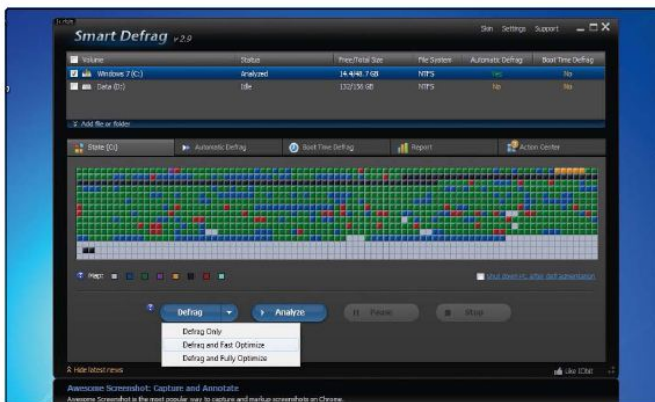
10 Disable unused hardware
 Your computer loads a lot of drivers when it first starts up, some of which you might be for hardware you don't even use any more. Switch them off by right-clicking 'Computer' then choosing 'Manage > Device Manager'. Devices such as Bluetooth controllers, modems and virtual Wi-Fi adapters are common culprits. Right-click on the entry and choose 'Disable'.



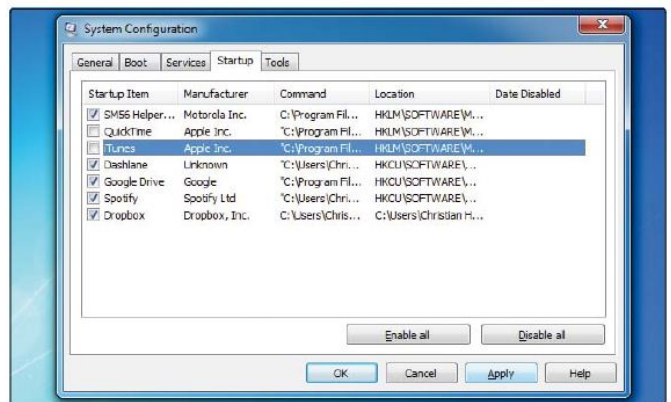
11 Remove fonts
 Amazingly, Windows 7 loads over 200 fonts at startup. To change this, open the Fonts folder (type **fonts** into the Start menu's search bar), highlight all the fonts you don't need immediately (hold down [Ctrl] and then click them), then click the 'Hide' button. This way, if you ever want them, you can bring them back, but Windows won't load them when it starts.



12 Spring clean
 We all know that hard drives get fragmented over time, with bits of files scattered across different parts of your hard drive, and reassembling these can waste valuable time at startup. Before you begin defragging your drive, remove any unnecessary files so it's as tidy as possible. Click 'Accessories > System Tools > Disk Cleanup'; select the files to delete and click 'Clean up system files'.



13 Don't forget the defrag!
 When you're satisfied that you've cleaned up as much as you can, you need to defragment the hard disk. We recommend using Smart Defrag (on your free disc) rather than Windows' own tool, as it does a more thorough job. Click the arrow next to the 'Defrag' button and choose 'Defrag and fully optimize', which organises your drive's data for maximum program performance.



14 Stay vigilant
 Some programs, including iTunes and Quicktime, have a habit of putting themselves back into the Startup tab of System Configuration (msconfig). This happens when those programs get updated from an older version. The only way to prevent this is to visit msconfig when you know you've updated some software. Just uncheck the items once again and click 'Apply'.

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Bring your PC bang up to date with the latest version of Windows 10 – it could be the last time you'll ever upgrade...

**TIME
TO**

UPGR



ould Windows 10 really be the last ever version of Windows? That is will it be an operating system that upgrades and evolves without

needing a major version increase? If you currently have Windows 7 or 8, you can find out for yourself, as Microsoft is giving you the upgrade for absolutely free. Read on to find out more, including how to cleanly and safely install Windows 10 on your machine.

Which edition?

Windows 10 is currently split into seven different editions, the key two being Windows 10 Home and Windows 10 Pro edition, which mostly mirror the home versions of Windows that we're used to.

Windows 10 Home (\$119, approx £77) is the standard version that Microsoft intends for use in, yes, the home. There's little left out: you'll get hot new features such as Cortana and the Edge web browser, as well as Windows-standard security tools such as secure boot and Windows Defender. If you're currently using Windows 7 Starter, Home Basic or Home Premium, or the standard Windows 8.1, this is the version you'll get as part of your free upgrade.

Windows 10 Pro (\$199, approx £128) is designed for slightly more advanced operation, and includes a few more features, including the ability to host a Remote Desktop session, additional data security with Bitlocker and the Encrypted File System (EFS), additional networking components, and Hyper-V, which allows the creation of virtual machines. In addition, the Pro edition will offer the option to defer updates for a limited time (the Home version applies updates automatically without user intervention) and ups the RAM support from 128GB to 512GB. Professional or Ultimate versions of Windows 7 and 8.1 will tick over to Windows 10 Pro.

Other versions include Windows 10 Enterprise, which is tailored specifically for business use on stability-critical systems, and a similar skew for academia, Windows

10 Education – both are available only to those who qualify for volume licensing, so they're unavailable for use in the home.

Windows 10's core code is also making its way to mobile devices with the Mobile and Mobile Enterprise editions, which will replace Windows Phone 8. Proving Windows 10's versatility even further, there's Windows 10 IoT Core, a stripped-back version tailored to small devices that make up the Internet of Things; think the likes of the Raspberry Pi, low-powered computers designed for specific tasks. Future releases will see Windows 10 reaching other devices, such as the Xbox One, and Microsoft has trademarked 'Windows 365', which may suggest that a subscription option is in the offing.

Get installing

Installing, as you'll find out, is a reasonably straightforward process, akin to version upgrades you may have previously performed. Upgrading from within Windows is even easier – it's a slick and seamless process that requires little to no input. In our testing, we lost no files or installed programs, although be aware that you may see a few default Windows apps disappearing – Windows 7's versions of, for example, Solitaire and Hearts will not transfer to Windows 10, because Windows 10 has its own.

Thankfully Windows 10 maintains a high level of compatibility with previous versions, and we're yet to encounter any software that doesn't work exactly as it did on the Windows 8.1 desktop.

If you're eligible for the free upgrade – that is, if you're running a properly licensed copy of Windows 8, 8.1 or 7 with at least Service Pack 1 installed – you'll see a windows logo in the taskbar at the bottom-right corner of your desktop. Click it, register your intention to upgrade, and you'll get the full, unfettered Windows 10 absolutely free. But there's more than one way to upgrade, and several things to bear in mind when you do so. Here we cover everything you need to know!

ADE



Installing is so easy, even this lot can do it...

WHICH WAY TO INSTALL?

If you're well prepared, putting Windows 10 onto your PC is a piece of cake – even if you have very specific requirements. Just follow our advice to see how

We're going to show you how you can install Windows 10 if you don't want to go for the simple in-OS upgrade. This will be either a clean install or a virtual machine install. The latter will leave your current machine pristine – perfect for testing out the advanced features of 10 without the risk of losing any data.

Coming clean

Let's start with a clean install. If you have a copy of Windows 10 on DVD, put it in your optical drive, restart your machine, and it'll boot from the disc. If it doesn't, you'll likely need to change a setting in your computer's BIOS/UEFI to put the optical drive first in the boot order. We can't be specific about exactly what setting to change and how, given the wide variety of BIOS and UEFI systems out there, but watch out for a message displayed on your PC's screen at boot time – you might see a small window in which to hit an allotted key, usually [F2] or [Del]. If you know the model of your PC, or the model of your motherboard in the case of custom-built desktop PCs, check your manufacturer's website for further instructions.

The above process is also true if you've transferred an ISO image to USB for installation; while there are a few more steps to take before you can get started as long as your install media is set to boot first, you'll be fine. You'll probably need to ensure you have your drive inserted into a port before you boot to BIOS in order to set this up. The actual installation process couldn't be easier, particularly if you've installed Windows 8.1 or 7 from scratch before. Once you're running the installer, just follow the instructions displayed on screen. The Windows 10 install process is even more simple and foolproof than ever before, and if you're careful not to let it overwrite a partition you're using, you'll likely have no problem.

But wait! Hold fire if you're looking to dual boot Windows 10 with 7 or 8.1; before you install, unless you already happen to have a spare partition, you'll need to use the Disk Management tool within your old OS to resize your primary partition and separate off a little space for Windows 10 to install into. The tools are almost identical in each OS.

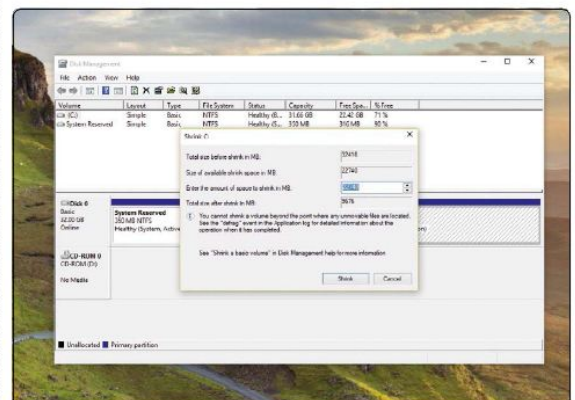
But wait... again! Before you can resize your main partition effectively, you'll need to make

sure all of your files are arranged by defragmenting it, leaving a portion of space at the end to be reallocated. Right click your primary drive in Windows Explorer, select 'Properties', open the Tools tab, and click 'Defragment now'. Now just click Defragment Disk to start the process.

Disk Management

Launch the Disk Management tool by opening the run dialog with [Windows]+[R] then typing **diskmgmt.msc**. The interface shows the partitions that exist on your machine – you'll probably have at least two, a small recovery partition and a much larger main

Go to the Disk Management tool for another option





Your BIOS or UEFI settings will allow you to choose your boot drive – if your PC isn't booting from USB or DVD, go here first

“If you want to test Windows 10 in a non-destructive way install it inside a virtual machine”

partition, and it's the latter we're interested in. Check in the volumes list at the top of the window that your chosen partition has enough free space (at least 16GB for 32-bit Windows 10 and 20GB for 64-bit, though we'd obviously recommend allocating a fair amount more). If you're short on space, you'll need to clear some files before continuing.

Right click your target drive in the Disk Management tool and select 'Shrink Volume', then input the amount of space you're looking to claw back. Be aware that the tool is looking for this in MB rather than GB, so add three zeroes to the end of your intended space in GB. Click 'OK' and the tool will go to work, and you'll be left with an area on your drive labelled 'unallocated space'. We now need to turn this into a partition. Right click it, select 'new simple volume', and click 'Next'. You can give this new partition any letter you like. Keep clicking 'Next' until you see the formatting options. Make sure you choose 'NTFS' as the file system, and label your drive ('Windows 10' perhaps?) before formatting the space. If you ever want to revert the changes and get the space back, you can use Disk Management's Delete Volume

and Extend Volume tools to expand your primary partition once more.

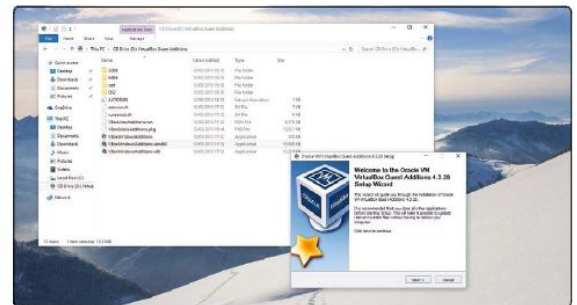
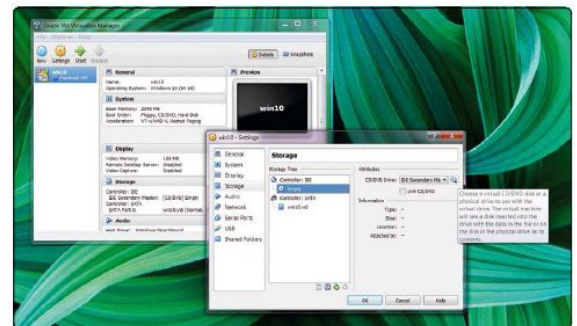
Go virtual

A final option, if you're looking to test Windows 10 in a non-destructive way, is to install it inside a virtual machine. You can do this with any kind of media – DVD, USB or ISO – and though you'll suffer a performance hit, this method gives you the chance to experiment without any risk. Grab the latest version of VirtualBox from www.virtualbox.org, install it (and its components), and run it.

Click the 'New' button, type in a name, select the appropriate version of Windows 10 in the Version drop down list, and click 'Next'. Leave all of the settings at their defaults, and click 'Next' and 'OK' until you see your new install added to the main VirtualBox interface. Now, with that VM selected, click 'Settings', go to the Storage page, click the disc marked 'Empty' under 'Controller: IDE', then the CD icon on the right-hand side of the window. Choose the appropriate install drive (or disc image, if you're using an ISO file) then click 'OK'. Click the 'Start' button, and your install will commence.



Microsoft executive vice president Terry Myerson explains the low-powered Windows 10 IoT core at the 2015 WinHEC conference



One you've installed within VirtualBox, install guest additions to get the most out of your VM

MEDIA GUIDE

If you've downloaded an ISO version of Windows 10, you'll need to turn this into valid bootable media before you can install it. If you have a writeable disc like a DVD-R, this is super easy: just pop it into your PC's drive, right-click the ISO, and select the appropriate option to burn it straight to the disc.

To transfer your ISO to a bootable USB stick, first make sure your target stick has a capacity of at least 8GB, and remove any files you want to keep, as the drive will be completely wiped as part of the process. Next, download Microsoft's Windows 7 USB/DVD Download Tool – ignore the name, this is valid for any version of Windows – install it, run it, and select the ISO file you've downloaded as the source and your USB drive as the destination. Let it run, and you'll soon have a bootable USB stick ready to install Windows 10 on your target machine.



Make sure any precious photos are backed up first

BEFORE YOU INSTALL

Just in case things don't go to plan, make sure you've got everything in order before taking the plunge

While it's highly unlikely that anything will go wrong in the course of an upgrade, we'd still recommend being safe – a new install is a good excuse for a backup! If you're heading for a clean install or an upgrade, you'll want to make sure you don't lose anything valuable in the process. Safe data is data stored in three distinct places – its original location, and two geographically distinct copies. This means an additional partition isn't really going to cut it, given that it's the exact same physical location as the original data; you need to use a high-capacity external drive, and some kind of online cloud storage. Most free services – Dropbox, Google Drive and the like – only offer a limited amount of space, so only place your most critical files online if you're not willing to pay. Services such as Carbonite or CrashPlan, which generally charge a monthly subscription fee, offer a much more extensive

range of backup options, and will generally do all the hard work for you.

Finding the files

The key location to have backed up is your personal folder, which will sit within the Users folder on your main drive. This includes all of your libraries – Documents, Photos and the like – and your Windows desktop. But do be warned it won't cover absolutely everything safely.

There's a small chance you're extremely organised, and you know where every file of a given type resides on your hard drive. There's a much larger chance that everything is scattered in various

separate places, so you'll need to dig everything up. Use Windows' search facility to find what you're looking for; open up Computer in an Explorer window and use the search bar at the top to search for, for example, *.jpg to find all of your photos, or *.mp3 for your music. Select the files from your searches and copy them to your external drive and, if you have available space, to your chosen cloud service.

Full on

If you have a big enough external drive, there's a way to be ready for any eventuality – completely back up a mirror image of your current hard drive, Windows and all. We'd recommend Macrium Reflect Free (www.macrium.com/reflectfree.aspx) for this; it's a particularly straightforward way to clone a drive, and while it doesn't have advanced features like incremental backups – these are saved for the paid-for versions – it does what you need it to do.

“Data should be stored in its original location, and two other places away from the PC”

POST-INSTALL BLUES

If things are not working well, you can choose to go back to what you had before. It's easy!



Occasionally, things don't work out. And this might be the case with

Windows 10. We're not judging you. Maybe something's gone wrong. Perhaps you tried the Insider Preview and now want to clean it off and install the full version, or maybe you're suffering from installer's remorse and want what you once had. If you've upgraded from a previous version of Windows, anything from XP up, there's a chance you can simply roll back to your previous installation – settings, software and all, including any files, such as photos or documents you've

If you aren't getting on with your new upgrade there are ways of going back

Find the windows.old folder in the root of your main partition and rename it to keep it safe

added to your Win 10 installation – without any trouble.

After installing Windows 10, and before doing anything else, rename the folder 'windows.old', which will be sitting in your C: drive. Call it something like 'win8.old'. Windows looks for 'windows.old' when doing a rollback, and it'll be replaced any time you install a new build of Windows – meaning that installing a new version of Windows 10 will overwrite it. Once you've renamed the file, it won't be overwritten. Alternatively, you could copy this file to an external drive.

Rolling back

If you're ready to switch to your previous version, first change the name of your renamed folder back to 'windows.old' (first renaming the current 'windows.old' folder, if there is one), or copy it back onto your drive if you've stored it elsewhere. Next, use Windows 10's search function to find 'recovery options', and click the top entry in the list. Under 'go back to an earlier build', click 'Get Started', click through the options, answer the questions, and be prepared for a bit of a wait. Alternatively, you'll likely be given a Windows Rollback option when you boot your machine, particularly if you're using a preview build of Windows 10 – this will do the exact same thing.

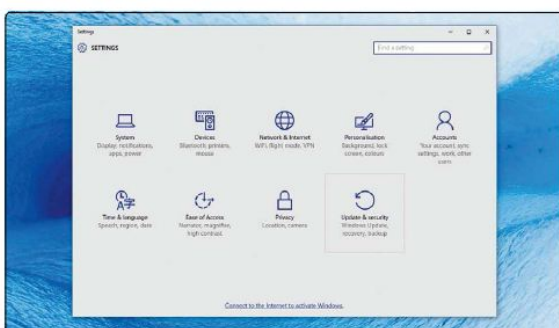
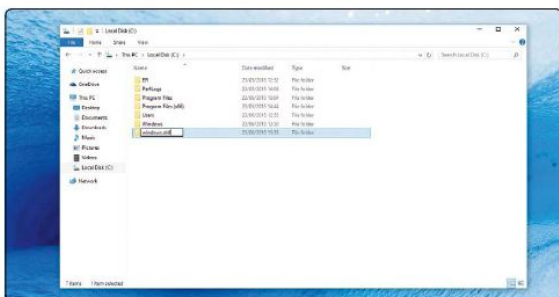
Note that you'll lose any programs you may have installed on Windows 10, so you'll need to

install these again on your new (old) operating system, but you should find that personal files stay. You'll also have to use your old password; if you've changed it for Windows 10, this change won't be passed back.

Bear in mind that Windows 10 will leave its mark in the form of a folder called 'windows.xxx', stored in your C: drive. This can be reasonably large – around 20GB – so you'll want to get rid of it once you've booted into your old OS. The disk cleanup tool will do this automatically. The reverse is also true, of course; if you're settled in Windows 10 and are sure you won't want to go back to your old OS, you can safely clear off your 'windows.old' folder and free up a little room.

Go extreme

If things have gone so wrong that you're unable to use Windows 10's rollback feature – if, for instance, you've inadvertently replaced your windows.old folder with one containing a previous build of Windows 10 – you'll need to restore from a backup. If you followed our advice about using Macrium Reflect on the previous page, this will be reasonably straightforward. Begin by setting up the Macrium Reflect recovery environment on a USB stick or DVD-R (use another computer if your current one is not working properly) boot into that, and use your backup to re-write the old operating system to the drive. ■



If you're rolling back to your previous version, just head to the Update and Recovery section of the settings panel

Learn how to...

Start to use the new Windows 10



Your guide *Zak Storey* says...

"Now you've finally got Windows 10 installed, it's time to find out what it has to offer"

At a glance...

SKILL LEVEL

- ▶ Anyone can do it
- ▶ Straightforward
- ▶ Tricky in parts

TIME TAKEN

- ▶ 1 hour

SUITABLE FOR

- Windows 10
- Windows 8.1
- Windows 7
- Windows Vista
- Windows XP

When it comes to aiding productivity Windows 10 has plenty on offer. Whether it's aero **snapping** your apps to corners or asking Cortana to help you out by setting reminders, it's all there to streamline your daily computing.

The best approach is to dive right into as many of the settings as you can – personalising your operating system, desktop and programs for the tasks you perform the most.

For instance, if Cortana isn't your thing, or you prefer not to search on the desktop through Bing then you can remove that part from the taskbar at the bottom of the page. Doing this will give you more screen space, as well as a tidier desktop and leave you with more space to pin programs to. But, these are just a few ways to improve your Windows experience, read on to learn more.

Jargon buster!

▶ Resolution

The resolution is how many pixels occupy the screen. The higher the resolution the more dots and the clearer your images will be.

▶ Snapping

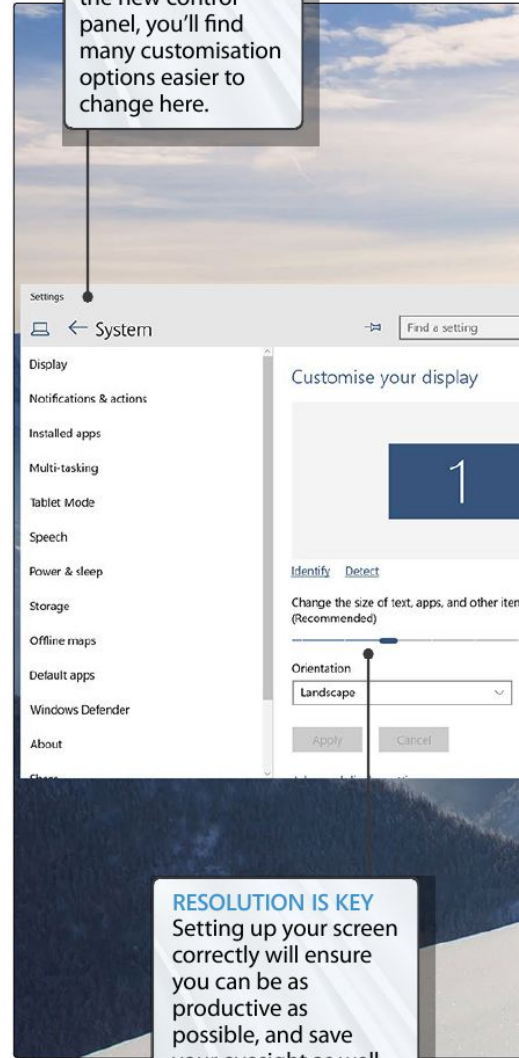
A way of arranging and resizing windows, by dragging them to the edge of your screen.

▶ Partition

A separate segment of your drive split off to organise and protect your files from viruses or data loss.

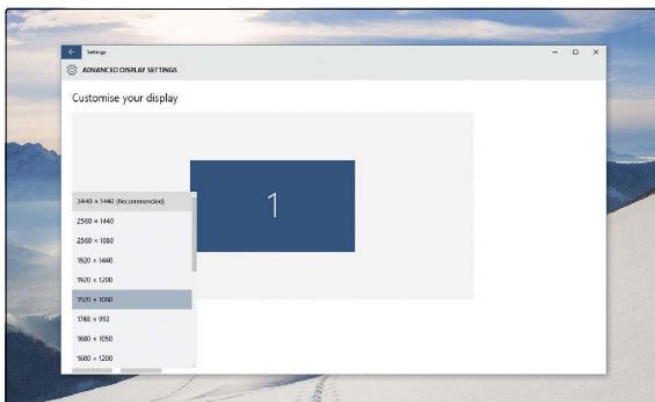
SETTINGS

The Settings tab is the new control panel, you'll find many customisation options easier to change here.

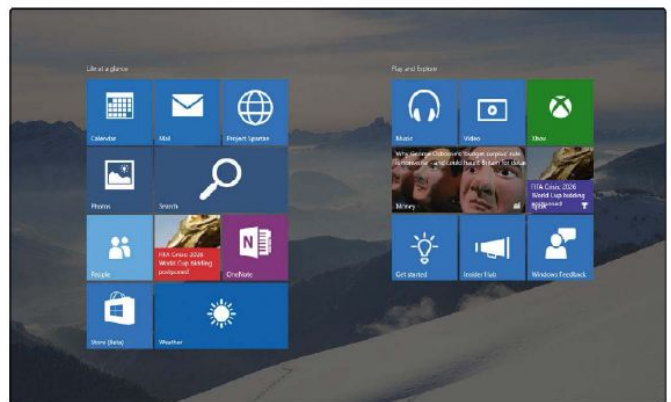


RESOLUTION IS KEY
Setting up your screen correctly will ensure you can be as productive as possible, and save your eyesight as well.

Step-by-step | Get started with Windows 10



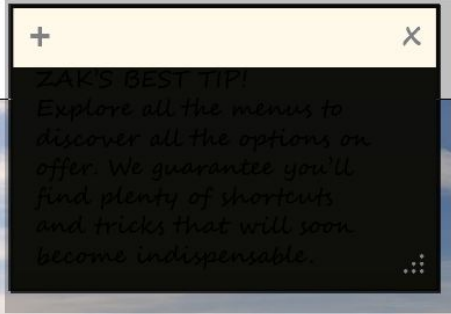
1 **Set up your screen resolution**
To help increase your productivity make sure your screen is running at maximum **resolution**. You'll find text and images is much clearer and easier to see. Right click an empty area of your desktop and select 'Display Settings'. You can now select 'Advanced Display Settings' in the right-hand window. Here you'll find the Resolution drop down menu – select the highest option.



2 **Switch to Tablet mode for 2-in-1 laptops**
Open the Start menu and select 'Settings! Here you'll find some tools you can configure to make your life easier. Enabling 'Tablet Mode' will make Windows 10 act more like Windows 8 – your apps will be fully sized and your Start Menu will expand to the entire screen. Ideal for 2-in-1 laptops and touchscreen all-in-ones.

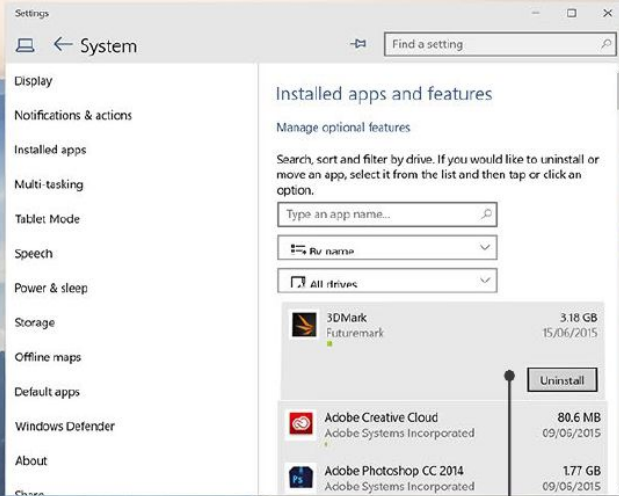
MULTI-APP VIEW

This little button makes switching between apps much easier.



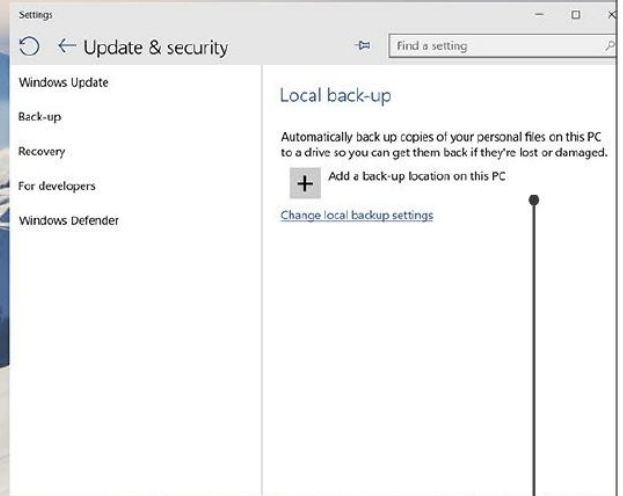
CORTANA

Your personal assistant, ask her for anything and she'll see if she can help, or just search the internet for an answer.



SPACE SAVING

Removing old programs frees up storage space and means Windows won't have to load up as many programs on startup.



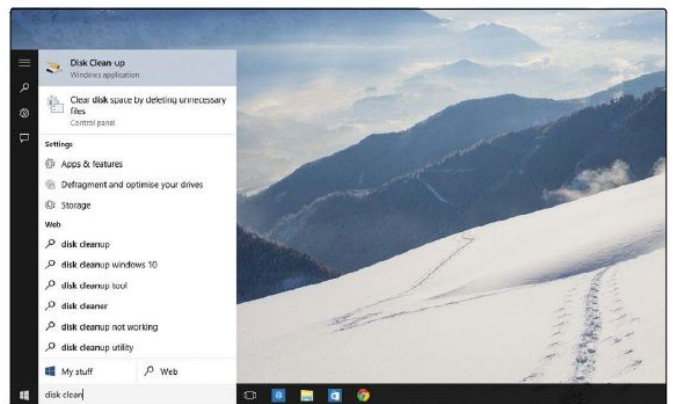
BACKUP

It's always a good idea to create a backup of files and documents, so you don't have to worry about losing your work.



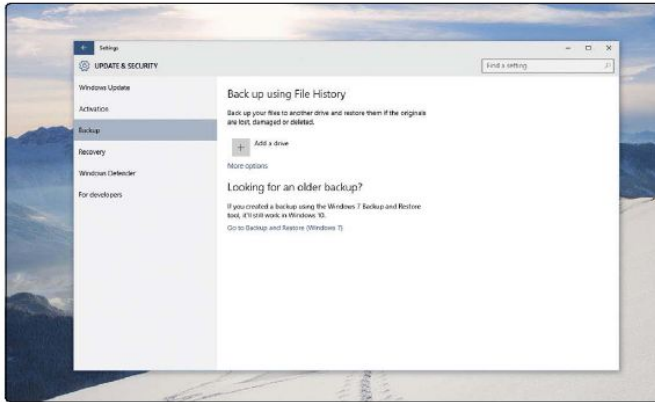
3 Aero Snap in Windows 10

Snapping programs to the sides of the screen was a feature introduced in Windows 7. In Windows 10 you can now snap applications to each corner, as well as to the sides, by left-clicking and dragging the top bar into a corner. You will also see a visual representation of how much screen space the app will take up. This makes it much easier to multitask with two documents.

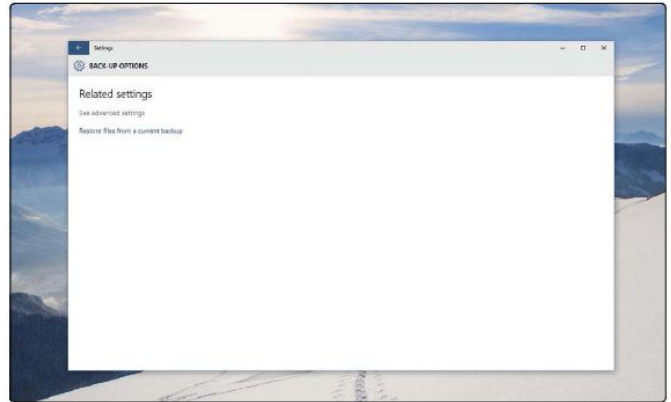


4 Uninstall programs

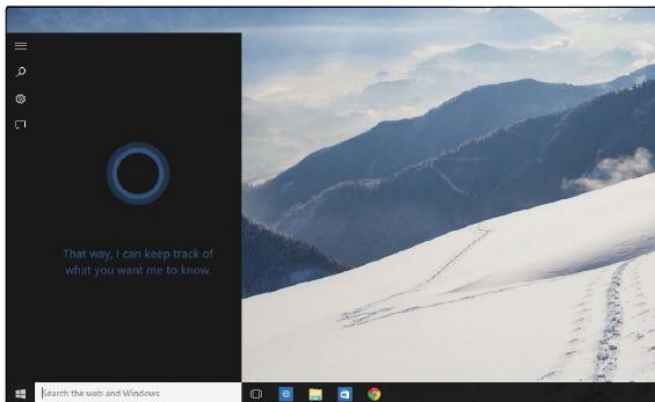
Uninstalling old and unused programs can be useful for freeing up storage space on your PC. You'll also notice your start-up times become speedier if you declutter. To do this, click 'Settings' in the Start Menu, select 'System' then on the left tab select 'Installed Apps'. Here you can remove apps by left-clicking them and selecting 'Uninstall'.



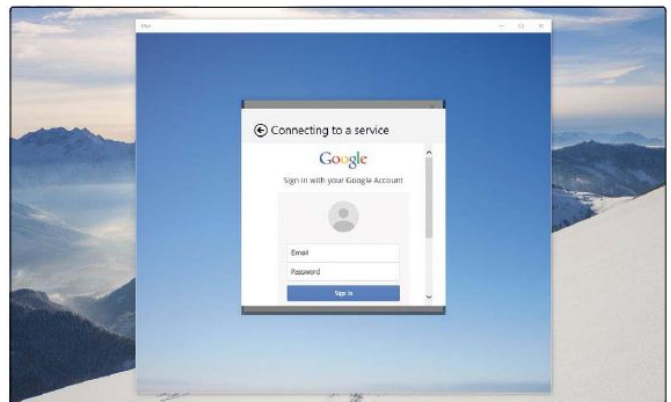
5 Create a secure backup
 You'll need around 120GB of excess storage in a separate **partition** or drive to create a secure backup of your PC's OS and documents every week. Go to 'Settings' and select 'Update & Security', then click on 'Back-up' in the left-hand window. Click on the '+' button and select the partition or drive you wish to use. Once done select 'more options', then 'See advanced settings'.



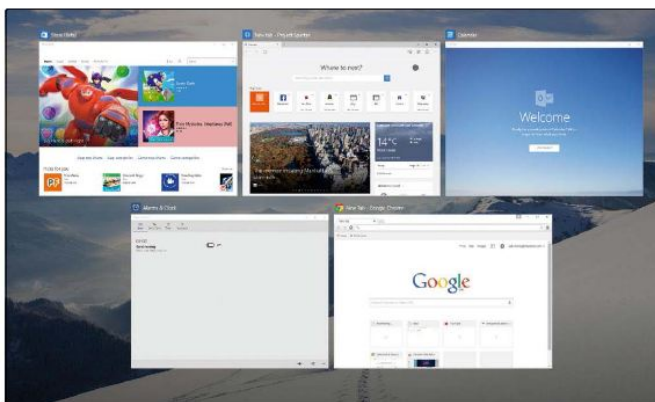
6 Finish the backup
 Now click 'System Image Backup' in the bottom left-hand corner of the screen, and click 'Set up Back-up' on the right-hand side of the screen. Highlight the drive you want to use for your backup and click 'Next', then 'Let Windows Choose'. Hit 'Next' again. You can now set up the schedule for when Windows performs the backup and then press 'Save settings and run backup'.



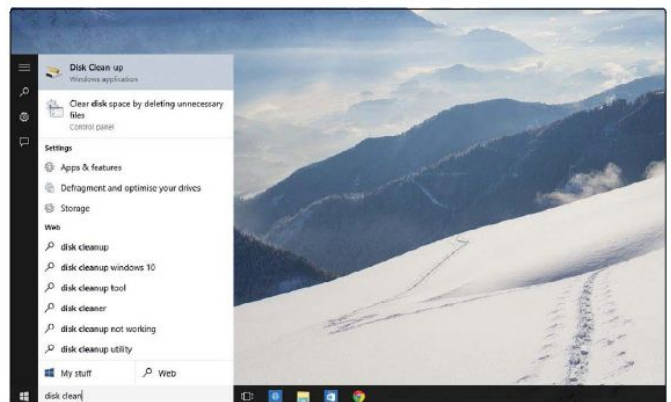
7 Cortana on call
 If signed into your Microsoft account you can use Cortana for many things from searching the internet, to setting calendar reminders or sending emails. To get going, just say "Hey Cortana" (making sure your mic is enabled) or type **Cortana** into the search bar at the bottom left-hand of your screen. If she can't do something for you she'll search the internet for the answer.



8 Organise mail accounts into one
 Keeping all email accounts in one place was a handy feature introduced in older versions of Windows 8. However, the Mail app that replaced Outlook has much more increased functionality. Click on the Mail icon in your Start window select 'Add account', select your email service and fill in the details. You can now select 'Done' and all your emails will be in one place.



9 Multi-App view
 Another neat feature is the ability to swap between many apps at any time. Just press 'Task view', the button to the right of the search bar near the Start menu. This allows you to quickly switch between open applications (including minimised ones) without having to trawl through the icons on your task bar, making it much easier to find programs.



10 Uninstalling the old Windows
 So, it's time to bid farewell to Windows 7 or 8 on your PC! To uninstall it, click on the Start menu and type in **disk clean up**, then open the 'Disk Clean Up' application. You can now select drive (C:), press 'OK' and let Windows scan the drive. Scroll down the open window and tick 'Previous Windows Installation(s)' tab, select 'Clean up system files' and you're done. ■

The T3 logo is displayed in white, bold, sans-serif font on a red rectangular background in the top right corner of the advertisement.

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OF LIFE IN TODAY'S
CONNECTED WORLD**



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SAMSUNG JS9000
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CORTANA

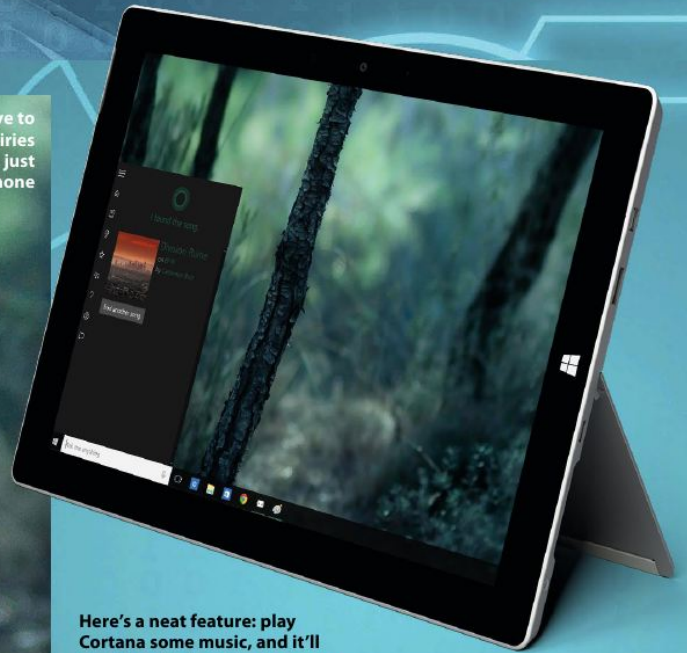
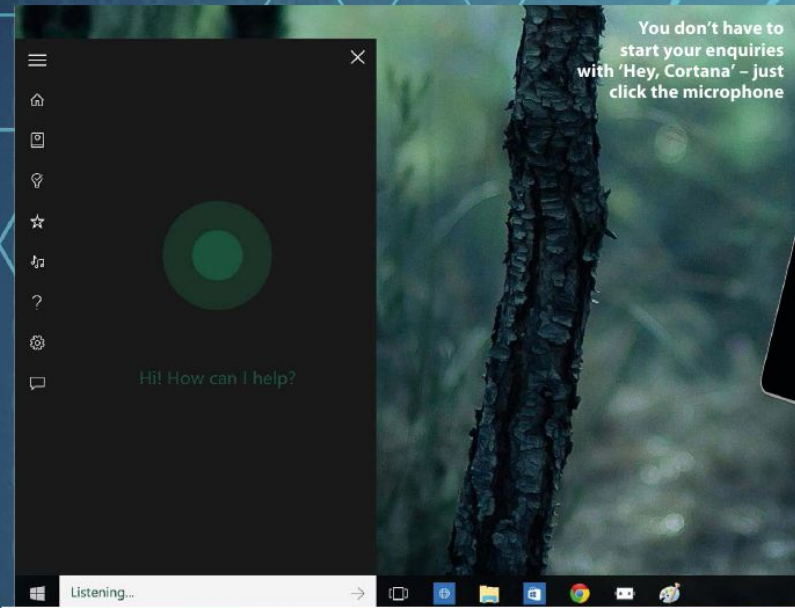
SEARCH EVOLVED

Microsoft's digital assistant has made its way to the desktop, and it's going to change the way you use Windows

Search has never been more important. As the information age progresses, and we're buried under more data, finding what you need quickly is essential. Microsoft knows all about this and has its own search engine, Bing, which has been working through many generations of Windows to improve and enhance desktop search capabilities.

With Windows 10, the company has gone one better. Not only is desktop search faster, but it's enhanced by Cortana – technology that has made the transition from the Windows Phone 8 platform. Cortana is a digital personal assistant, named after – and inspired by – the virtual helper from Microsoft's Halo games. Cortana understands natural language, accepts voice commands, and can do so much more than finding a file

or web page, as you'll soon discover. But first, where to find it? Cortana is integrated into Windows 10's search facility; by default, you'll find a search box on the left-hand side of your taskbar, next to the Start button. If it's not there, you can reactivate it from your taskbar's properties window. Also make sure you have a microphone plugged in, or that you've configured your laptop's mic, as Cortana comes into its own when you say what you want rather than typing it.



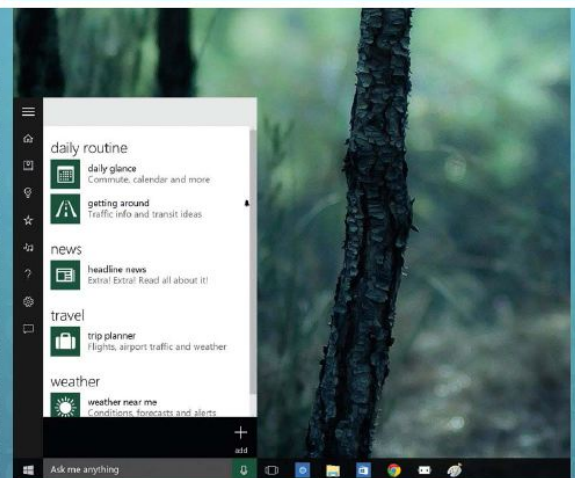
Practical magic

The first time you click Windows 10's search box, you'll be given a little guide to Cortana's features – scroll through it if you like, then click 'I'm in' to get started. This does mean giving Cortana access to a lot of information – contacts, emails, search history and the like. There's not an awful lot you can do about this aspect, but think of Cortana in terms of it being your personal secretary; if you had a secretary in business, they'd be pretty useless without the appropriate access. Click 'I agree' to finalise your decision to use Cortana – you can switch it off later, and if you don't wish to give up your information you can always use the search box to find your stuff in the traditional way. Next you'll be given the option to

Get digging

So let's start with the basics. Type a file name, a snippet of text, whatever might help you find the thing you're after in the search box, and you'll be presented with a list of options. The topmost option will be what Windows reckons is most likely to be the thing you're looking for. If you're after multiple things, you can type (for instance) *.jpg and hit [Return] to open an Explorer window containing that search.

Cortana can do slightly more impressive things than that, though. If you're looking for a spreadsheet, for example, try asking: say "Hey Cortana" then "Find my spreadsheets", and Cortana will dig up all the .xls files it knows about. The same is true for broader file types; ask Cortana



The notebook contains Cortana's knowledge of your likes and dislikes, and you can enable additional features here if you wish

But enough straightforward searching. A personal assistant is wasted if all they do is spend time digging through your files, particularly as that's not an especially new or innovative job. Cortana's strengths lie in its ability to bring you the information you need quickly and, ideally, without even touching your mouse.

Try asking Cortana what the weather will be like tomorrow; the phrasing isn't particularly important, as the software is clever enough to interpret most questions in a natural manner. You'll be shown the upcoming weather in a neat, digestible format within the Cortana bar, with no need to launch a web browser, and Cortana will also speak the information, meaning you don't need to look at your screen at all. Try something similar; ask Cortana what the time is in, say, "Sydney, Australia", you'll be shown and told.

You can also use Cortana to automate common tasks; if you have the right software and

leave Cortana listening for the key phrase 'Hey Cortana' at all times. It's up to you if you want to switch this feature on or not; it's smart, but it makes some people a bit nervous. You can still activate Cortana by clicking the microphone icon, or typing in the search box. Tell Cortana your name or nickname – you could be creative here, but bear in mind that Cortana will repeat it back to you – and click 'Use that'. If you aren't signed in with a Microsoft account, you'll need to do so now

to find your photos and it will filter out what it thinks are likely to be photo files from the other images on your computer. Cortana's scope also extends to anything you might have stored on Microsoft's OneDrive cloud service, which is especially useful if you have your PC set up to mirror, for example, the contents of your Dropbox or Google Drive. That will appear in the searches (we'd certainly recommend doing this unless you have a critically small hard drive).



The original Cortana AI featured in Halo



address books set up, you could say “email Fred Bloggs” to open a compose window with your addressee already filled in. Asking Cortana to “search for Bristol Rovers” will pop up an Edge browser window with a Bing search to your information. Sadly there’s no existing way to change the target browser or search engine – Microsoft obviously promotes its own stuff – but you can bet that enterprising hackers will find a way to use Cortana with alternate browsers and search engines before too long.

Refining

As you use Cortana, if you make frequent requests for specific information, or if you’ve given it access to your social and email accounts, it’ll learn a little about you and the sort of thing you often need to know at a glance. Click the search bar without typing anything and you’ll be given a look at the info Cortana thinks is relevant to you, so if you’re always asking what the time is in Italy and you’re obsessive about the weather, this will be available at a glance.

Cortana may even spend a little time asking you direct personal questions – this was certainly the way it went about things on the Windows 8.1 platform – to ascertain your likes. Alright, they’re personal, but not ‘what shape is the birthmark on your

inner thigh?’ personal; more the sort of thing that narrows down your news preferences, your favourite places to eat, your schedule. In the future, if you ask Cortana what’s in the news, it should push the stories that mean the most to you to the top.

Most of these things can be directly altered by checking out Cortana’s notebook, which is where the program sketches the information it knows about you. You’ll find it in the left-hand menu of the search bar after you’ve clicked the three-lined

hamburger icon. Use the notebook to refine your profile; other users will have their own notebook, so don’t worry about being bombarded with your kids’ updates. If you share, you can tell Cortana that you’re not interested in Pokémon here.

YOU’LL NEED THIS

If you want to talk to Cortana, a microphone is essential. Any headset will do the trick nicely. You may even get good results with your laptop’s built-in microphone, as long as there’s not too much background noise.

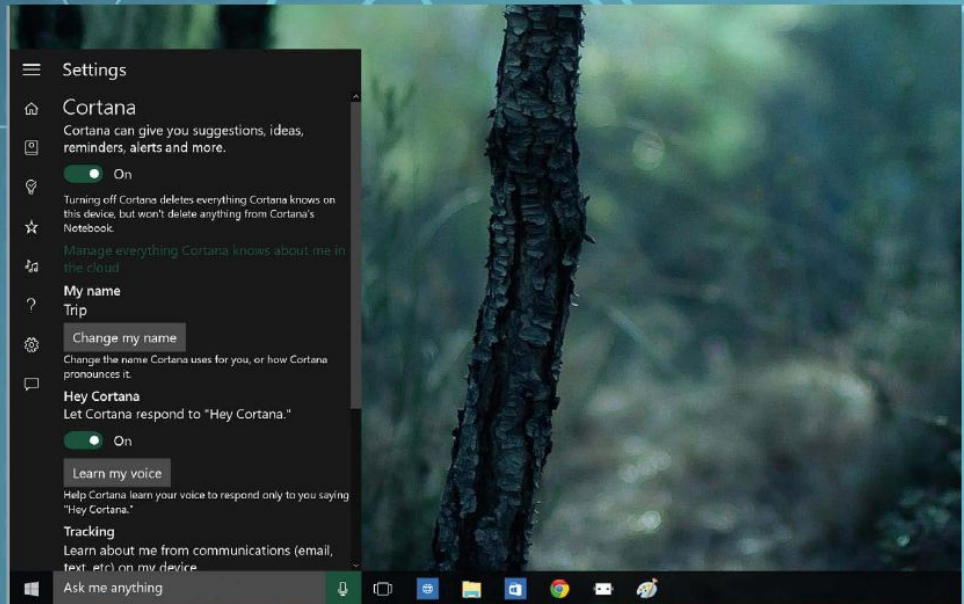
For the full effect, though, we recommend an omnidirectional mic, such as the Blue Microphones Snowball, with the gain set quite high. That way you’ll be able to activate Cortana and use your PC – even from a distance. When Cortana’s software manipulation skills improve further, and you’re able to tell it exactly what you want to watch or play, this will make for a perfect hands-free media centre.



More features

Cortana's pedigree is actually rather strong. Although the software originated on Windows Phone 8.1, which has a dismal market share hovering somewhere around 3% of the global smartphone market, Cortana is respected as one of the best virtual digital assistants, with many analysts putting it above Siri and Google Now. The mobile version is packed with features so useful that it transcends the self-conscious shame of talking to your phone in public.

Windows 10's version of Cortana is based on the same technology, and while it lacks a few of the core features that the phone version relies upon – dialling numbers and sending texts, for obvious reasons – there's plenty of useful corellaries; you can, for example, use it to open a program. Say "Hey, Cortana – open Edge" and it'll open the Edge browser. This might take a bit of fiddling to get



Use the settings window to restrict Cortana's access to your information, or switch it off completely

right; if it doesn't know the name of the program you're after, it may open a Bing search instead. The functionality extends to closing programs, minimising, maximising and more. You can even, if you're careful, dictate emails to Cortana. Just say "email", followed by the target email address, the subject, and the body of the message.

The future

There are still niggles with the system. But given that many laptop manufacturers will be introducing keyboards with a dedicated Cortana key in future ranges (those of us without a dedicated key can just hit [Windows]+[C] instead), it's obvious Microsoft has big plans for the assistant's integration. The key is to try it. Think of something

you'd want Cortana to do, and ask for it. It may not work; if it doesn't, try rephrasing your request. Try making your language *less* natural. It may seem counterintuitive given that Cortana is supposed to recognise everyday speech, but until it is finely tuned by its developers, you're going to have to work with what you've got.

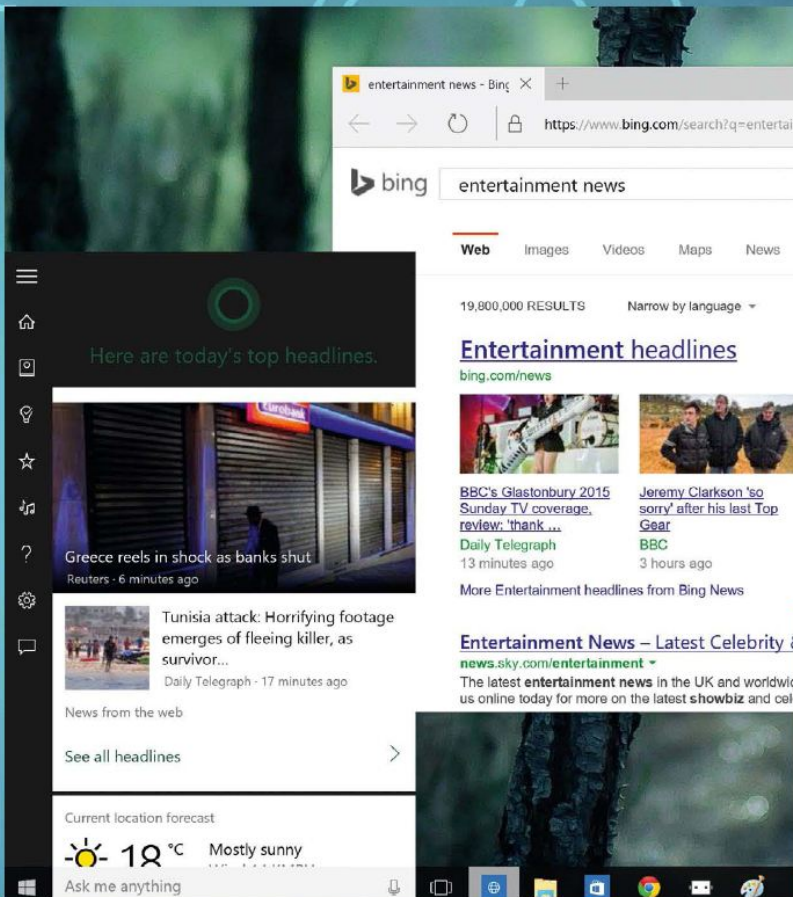
Users on desktop PCs will likely have a different experience to users of laptops, too. We've already mentioned the dedicated key on certain brands, but there's more: Cortana can look after your battery and accept questions about it, which won't apply to desktops. The Windows Phone version revels in location-based information, which will come into its own if you're carrying a laptop

Cortana has a sense of humour, but it's up to you to find it

If you're typing a search, you often don't need to hit Enter to see the information you're looking for




If Cortana doesn't know the answer to a question, it'll search the web for you



TRY THIS INSTEAD

Just because Cortana doesn't play nicely with non-Microsoft products it doesn't mean you're stuck using it if you're a devotee of, say, Google's suite. We'd recommend trying Google's voice search, which anyone with a copy of Chrome can use. It's not enabled by default, so open Chrome and type `chrome://settings/` into the address bar. In the search section, check the box next to 'Enable OK Google'. Now just open up a new tab, say 'OK Google' and speak. You're just performing a Google search, but since tools such as a calculator, calendar and Wikipedia summaries are built into Google's search engine by default, you should find what you're looking for.



or tablet around with you. We'd expect Cortana to improve with every build of Windows 10, particularly as Microsoft puts more weight behind it. It could well be a big advertising point of the new OS; it was in its mobile form. By autumn 2015, Cortana should be realising its full potential, and we may even see brand-new features.

Under the skin

Even though Cortana is an AI, it's still open to a little fun. You can bombard it with irreverent questions; granted, many will open an Edge window to a Bing search, but you could see some fun results.

You can ask Cortana how it is. Ask what it's doing. Ask it the meaning of life, the universe and everything. And then you can ask the questions again to see more responses. Ask it to sing you a song; if you're lucky enough to be using the US English version, you'll hear a snippet recorded by Cortana's voice actress Jen Taylor – the same lady that voiced Halo's Cortana AI. There are tons of interactions like this to find, which is great if you need a little distraction. Try also references to other famous AIs such as HAL or the *Star Trek* computer.

Finding facts

Cortana will also help you dig up facts and figures. Ask it how old an actor is, how tall they are, what their latest film is called, and it will find answers. You can also ask reasonably complex questions, such as "What was the date of the first Monday in 1982?"

Set it mathematical challenges – ask it your basic mental arithmetic questions, or say "Hey, Cortana, what's one divided by zero?" to scramble its brains. You can check out the stock markets, find out the price of individual shares, or convert currency or measurements at a glance. And, of course, things have to come back to work eventually with Cortana's scheduling features. You can ask it to organise your life a little, setting reminders, calendar entries, adjusting meeting times, and asking it to recall information it already has stored about your upcoming movements. Basically, think of Cortana as a real-life assistant and treat it as such.

Cortana's gimmicks are fun, and its range of organisational tools and quick-access facts are useful. But here's the truth: you're unlikely to use it much at first. The digital assistant features jar with our usual Windows experience, and

the version we've been able to use in testing this article still needs a few tweaks to its brain. But eventually its benefits will shine. You'll shout to your PC from across the room and the right things will happen. You'll search faster than before. And a stronger, more prominent, more sensible search facility (one that will follow from your desktop to your browser if Edge continues to be as brilliant as its early versions are) will mean the way you use Windows in the future will evolve. Hey, Cortana, hurry up and realise your potential.

Learn how to...

Use Virtual Desktops in Windows 10



Your guide *Zak Storey* says...

"Using multiple virtual desktops is a fantastic way of organising work into separate manageable areas, each specific to the way you use your PC"

At a glance...

SKILL LEVEL

- ▶ Anyone can do it
- Straightforward
- Tricky in parts

TIME TAKEN

- ▶ 15 minutes

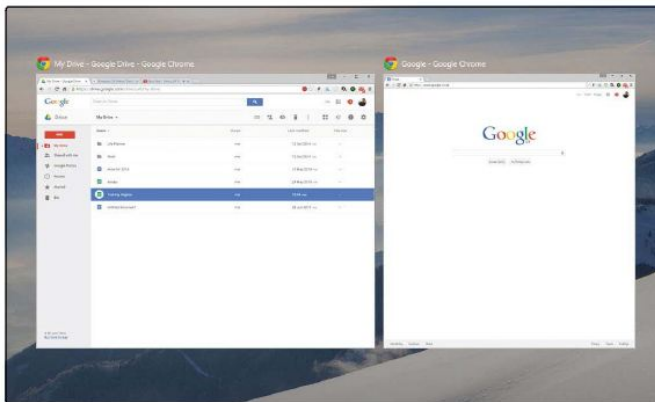
SUITABLE FOR

- Windows 10
- Windows 8.1
- Windows 7
- Windows Vista
- Windows XP

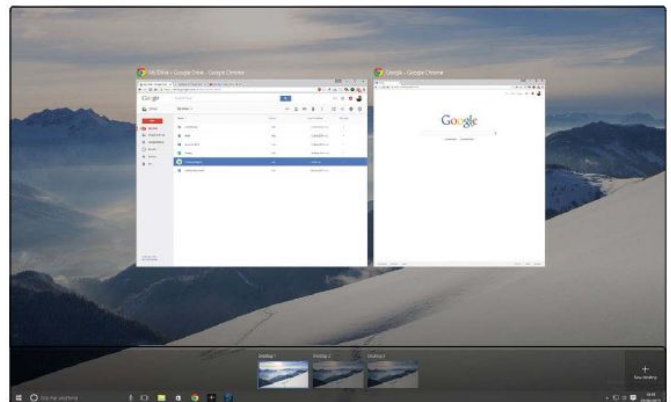
The ability to have (and swap between) multiple desktops is a feature that has long been missing from Windows. If you use your PC for gaming, but also for office work, for example, it can be indispensable, (and less confusing) to have an individual desktop for each. In this tutorial, we'll walk you through Microsoft Virtual Desktops – a feature that is new to Windows 10. This feature not only gives you more desktop space for separate task-related windows, but it also allows you to quickly and easily access what you need, so you're ready to go. What's more, because you're not creating a virtual machine, you won't be take up any precious system resources or space with your additional desktops. Let's get going!



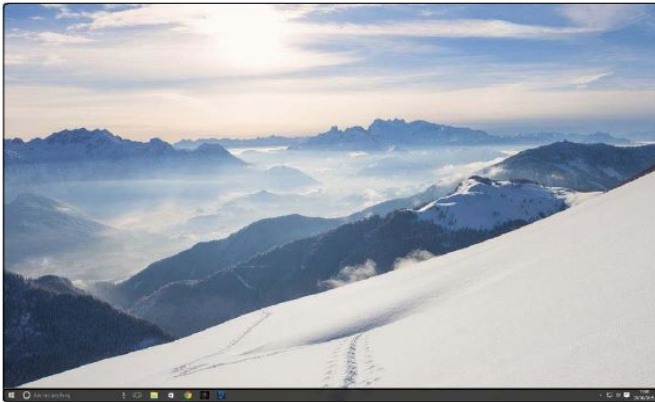
Step-by-step | Adding Virtual Desktops



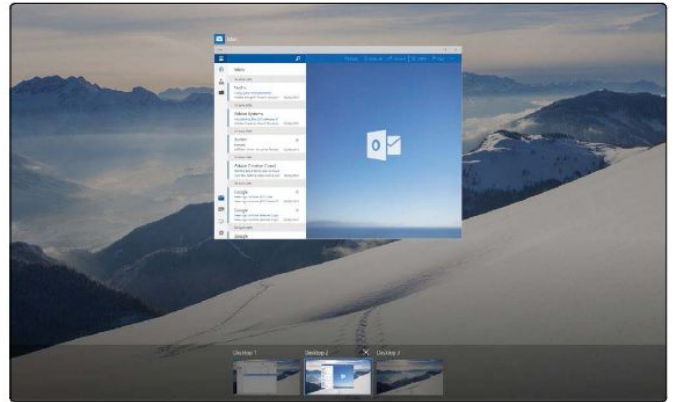
1 **Opening your Task View**
The Task View button sits to the right-hand side of Cortana's search menu. To get going with Virtual Desktops click the Task View button and it will open up the multi-app view. In this view, you can see every application and window you currently have active on your main desktop.



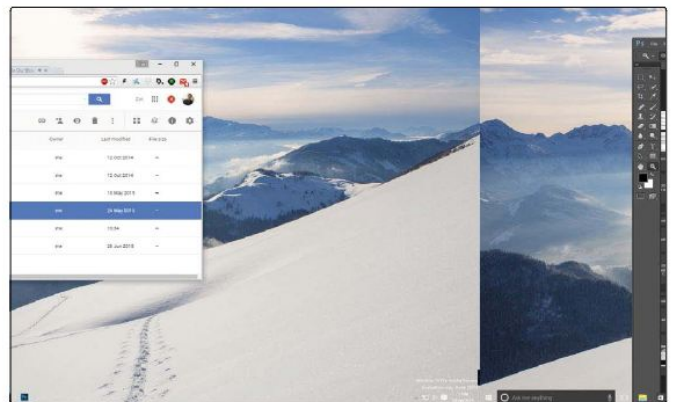
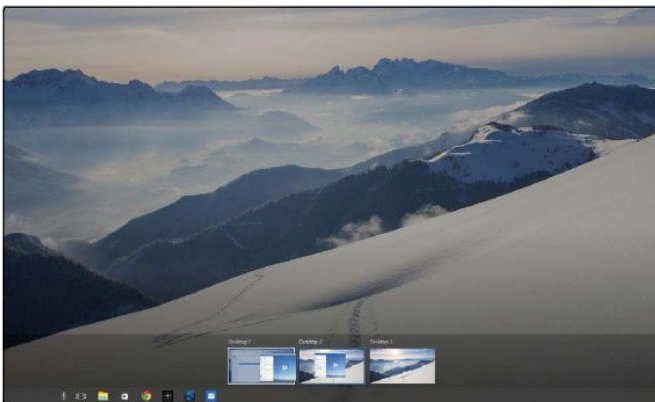
2 **Adding a new Desktop**
Adding a new desktop is straightforward. Move your cursor to the bottom right-hand corner and left-click 'New Desktop'. Here you can add as many desktops as you need. Once you have added these, they will act as separate hubs for you to place your open applications into.



3 Organise main Desktop and add applications
Unfortunately, you cannot assign shortcuts and files to particular Virtual Desktops. In fact, the shortcuts or files you place on the first desktop will appear on all desktops. With that in mind, you should keep your main desktop as clean as possible, by removing or moving applications or files you don't use.

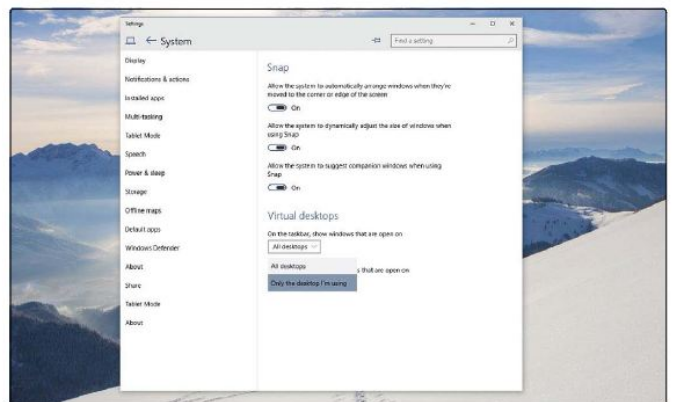
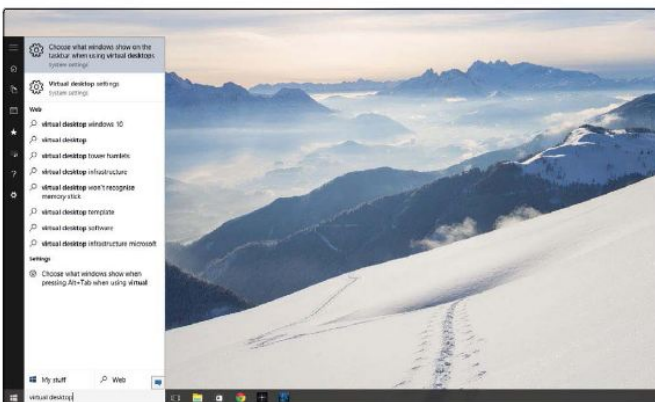


4 Seeing what's open on each desktop
If you want to know what's open on what desktop, open 'Task View' again, by clicking the button to the right of the Start menu. Now hover over each of the desktop tabs at the bottom of the screen. Windows will then display in its main window which applications are open on each desktop.



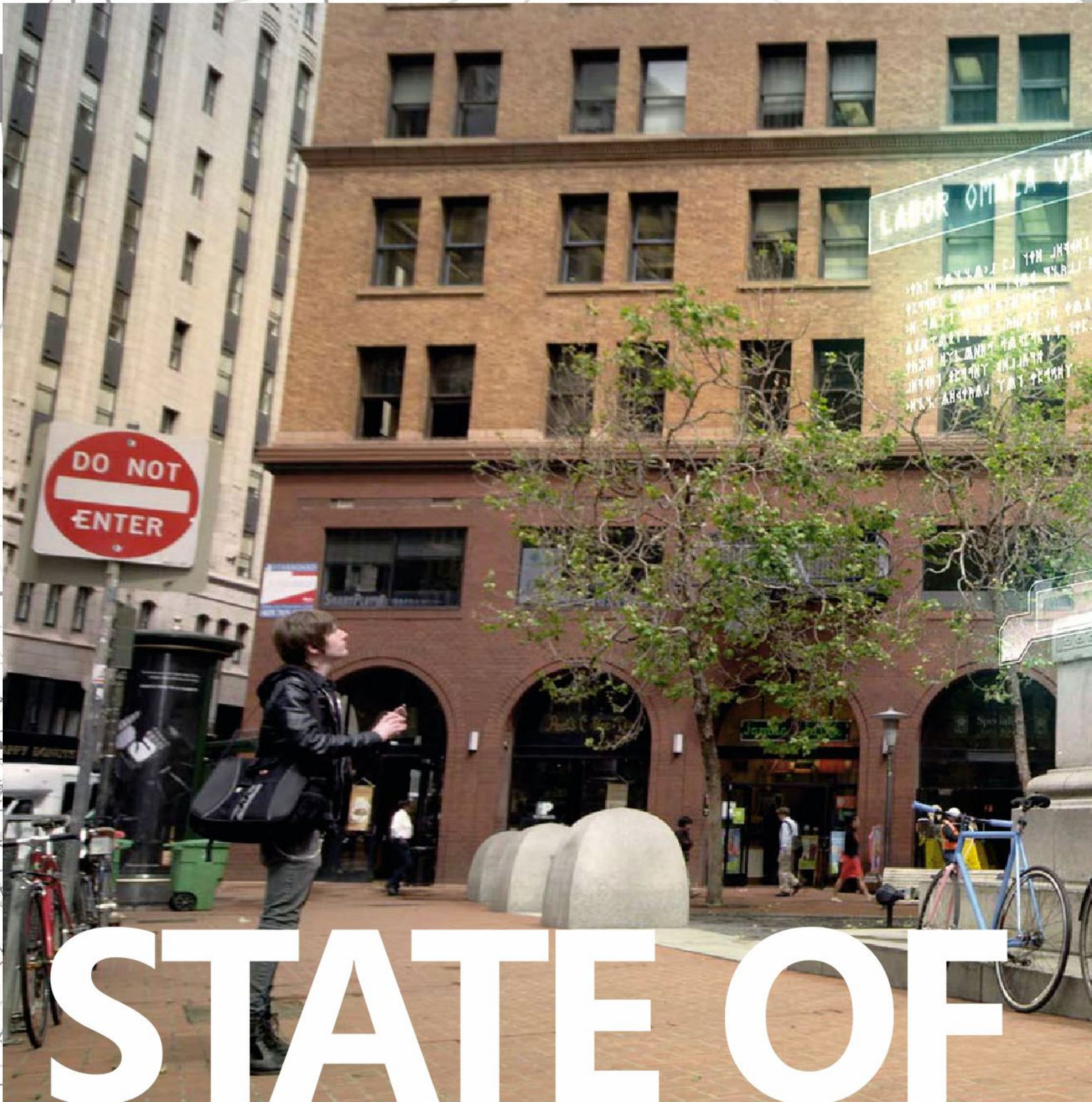
5 Move open apps between Desktops
There's a straightforward way to quickly move one application from one desktop to another. Just go to Task View again, then simply left-click and hold the open window or application you want to move, you can now drag it to the destination desktop.

6 Some useful shortcuts
There are many shortcuts you can use with Virtual Desktops. To switch to the previous or next desktop, press the Windows button with [Ctrl] and the left or right arrow keys. To close the desktop press the Windows button with [Ctrl]+ [F4]. To jump into the Task View press the Windows button with the tab key.



7 Show all open apps in Task Bar
You can enable your task bar to show all the programs that are open on all the desktops, so that it, in effect, acts as a hub. Simply type **Virtual Desktop** into the Start menu, open the settings and change the first dropdown menu to say 'All Desktops'.

8 See open apps from one Desktop
Pressing [Alt]+[Tab] is a quick way to see all open apps across multiple virtual desktops. However, if you only want to see programs on the current Virtual Desktop, go to the Virtual Desktop Settings again, and select the 'Only the desktop I'm using' option from the [Alt]+[Tab] drop-down menu. ■

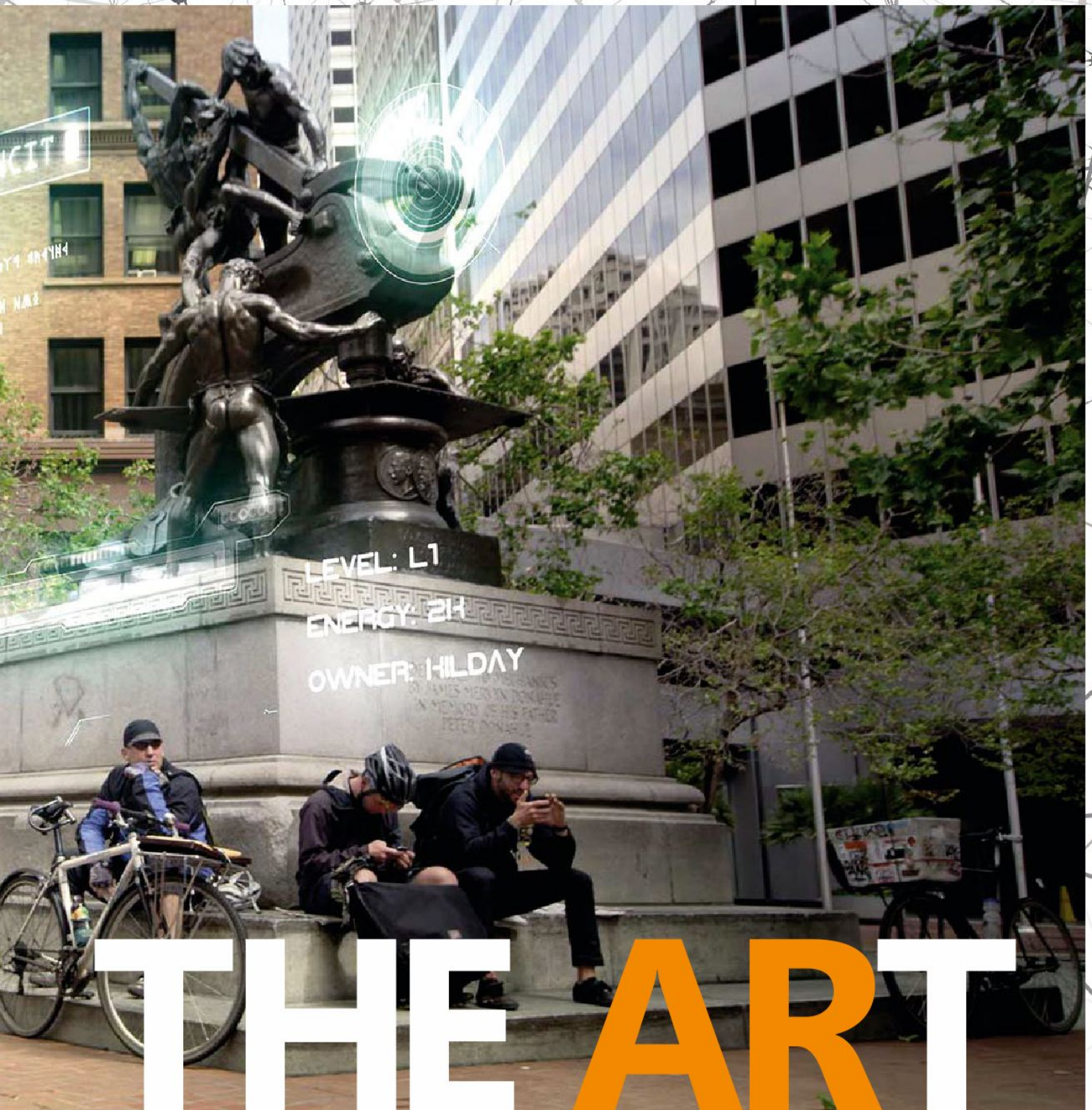


STATE OF

Is augmented reality little more than virtual reality's younger sibling?
Dan Giliopoulos find out more

Anyone who reads the tech and videogames press, will know the current buzz is all about virtual reality. Valve revealed its long-hidden VR product Vive, built with HTC, in March. Oculus Rift, meanwhile, has been bought by Facebook.

Yet, quietly, people are whispering that the real story is augmented reality (AR). Influential data firms, such as Juniper Research, have even put figures on it. Juniper's Augmented Reality 2015-2019 report predicts revenues of



THE ART

\$4.1 billion for AR apps in 2019, with 1.3 billion apps in use. By contrast, Digi-Capital is advising that AR could be worth \$120 billion by 2020, with VR valued at a mere \$30 billion. That reflects fundamental differences in both the underlying experience, and the progress made, in each field. We'll explore why that is, and whether virtual reality has any chance of catching up.

As part of that, we'll delve into the way big media corporations – including

Microsoft, Valve, Google, Apple and Sony – are looking at this space. Each of them has its own strategy. Several have already invested billions – such as Google with Magic Leap and Microsoft with HoloLens – while others have already walked away, such as Valve, with its deliberate pivot towards VR.

That also means examining how AR tech is currently working, and where the next steps will be. After all, low-grade AR has become commonplace in several types of mobile application and is

looking to become more widespread. Digi-Capital's prediction is based on AR capturing a substantial chunk of the mobile phone market – and with over a billion smartphones already shipped, you could say \$120 billion was a conservative estimate. But then it's only talking about five years away.

It took 20 years for mobile phones to move from the Nokia Ringo, which could merely call people, to today's all-singing, all-dancing smartphones. For the full lowdown, read on.

The core difference between virtual reality and augmented reality technology is the worlds they move us into. One replaces, the other improves. Virtual reality creates a new world for you that's fundamentally separate from the world we inhabit. No perception that you see through virtual reality is what's outside of that headset. It's a tech for immersive experiences – escapism such as movies or games.

Augmented reality, by contrast, focuses on the real world as the base, and builds on top of it. AR generates virtual items in this world by either using sensors to ensure they're correctly placed on its surfaces, or ignoring them completely and placing it on a much nearer plane.

AR's is not so good for immersion, because the real world is always there in the background. But it means it's excellent for anything involving augmenting the real world. Voice calls, advertising, mapping, social networks... or even what Tim Merel of Digi-Capital calls 'a-commerce'. Yes, augmented shopping.

There are degrees of augmentation, of course. Device-led AR, where the AR is imposed on a screen that's distant from the viewer, is a mediated reality that allows developers to more simply judge the environment. At its simplest, it acts as a head-up display (HUD) that sits over the scene like a 3D-movie title sits on its background. This basic tech is the level that firms such as advertising innovators Blippar or Aireal use. It simply uses your existing device and an app, and imposes a new image on an existing scene, such as putting an animation of a football player near his promotional merchandise.

At a slightly more advanced level, this tech can detect a surface or shape in the environment and use that as a marker to estimate relative depths in the scene. You'll have AR apps that use special 'fiducial marker' cards to anchor their sim, and allow the app to scale and rotate a virtual simulation to fit the environment.

The more VR-like AR requires a lot of extra tech. You need to be able to track the position of the viewer's head and their eyes, and judge relative distances, to make the illusion of something virtual be convincing. Most of these AR devices use a head-mounted display (HMD), which is a headset supporting a display device (or two) in front of the user's eyes.

The sort of HMD we're interested in also tracks the head position along six degrees of freedom – a phrase that means three components of translation (up-down, forwards-backwards, left-right) and three components of rotation along those axes.

There are more extreme techs in development as well. Two different sets of contact lenses are in development, one academic, one military. The

military ones are called iOptik and function much like bi-focal lenses, with the twist that they're designed to work only with AR goggles. These contact lenses will allow humans to focus both on the background scene and the HUD on the goggles at the same time. Though they're being developed for the US Department of Defense, the company behind them hopes it can sell them as consumer products soon.

The more interesting academic tech comes from the University of Washington, and is a set of 'bionic' contact lenses powered by radio waves and with LED displays built in. (The microfabrication process that means they self-assemble their circuitry using osmotic pressure is fascinating and totally irrelevant). At the moment, the lenses have only been tested on rabbits, so it's still at an early stage and there are questions about the quality of the images it produces. Still, it's an impressive glimpse of the future.

Of course, this is all minor stuff, mostly built in the hope that the big tech firms will buy out the company behind it. What's of greatest interest now is what those firms are focusing on, and what they think they can do with it.

Valve's blown out

What's most interesting about Valve's AR offering is that it's no longer Valve's AR offering. In 2013, Valve released 25 people, including its entire AR team, to focus, we presume, on VR.

The two AR project leads were given Valve's permission to do whatever they liked with the tech that they'd made, which they've called CastAR. They've created a company called Technical Illusions to finish it off.

CastAR is a bit different from other AR. It consists of a pair of polarised glasses with built-in projectors and cameras, and a separate retro-reflective surface studded with infrared LEDs. The camera uses the LEDs to track your head movement, so it can adjust the images that the projectors cast onto the surface. This means each lens gets a different, but coherent, image. Low latency lets you do things like look around an object. In other words, it projects a self-contained virtual reality into the real world.

As a result, it's used for static purposes rather than something more mobile, like the Samsung Gear VR and Nintendo 3DS. CastAR's pitch video focuses on uses including previewing 3D architectural blueprints, playing 3D board games remotely on unexpected surfaces, creating 3D presentations, and just for use as a 3D desktop PC. As long as you put that retroreflective material all over your house.



TRY AR TODAY

There are many older ways to try augmented reality today. As it's a more mature technology, there are some basic devices that take advantage of it already, as well as many mobile phone applications to try. The Carl Zeiss VR One headset, for example, supports AR features and will work with any iOS or Android headset between 4.7 and 5.2 inches. Google Glass has now been cancelled, but that's out there too.

There's a huge array of AR apps for mobile phones. One of our favourites is GoSkyWatch Planetarium for iPhone and iPad. This is one of many stargazing apps that use the device's accelerometer and GPS to orient your device, so wherever you're pointing, it shows constellations, stars and nebulae. See also Anatomy 4D, Google Goggles (which can translate text on the fly), Field Trip (which lets you know about nearby attractions), and iOnRoad Augmented Driving, which gives speeding alerts, crash warnings and driving analytics.

The Playstation Vita has AR features, and comes with a package of free AR games, such as Table Ice Hockey and Pulzar. Similarly, the Nintendo 3DS comes ready-loaded with AR Games and six AR cards. Every game is super-imposed on the real world, but has no interaction with it – it's more of a gimmick, really.

If you've got a PS3, you could pick up a copy of Wonderbook. It was a Harry Potter-inspired AR tome with blank pages that only filled when viewed on your TV through the Playstation Eye camera. Similarly, the PS4 has Playroom, a much smoother AR sandbox where you can play with small robots that are running around your lounge.



The Google-funded Magic Leap team includes superstar SF novelist Neal Stephenson



Magic Leap works by projecting a display straight onto your retina



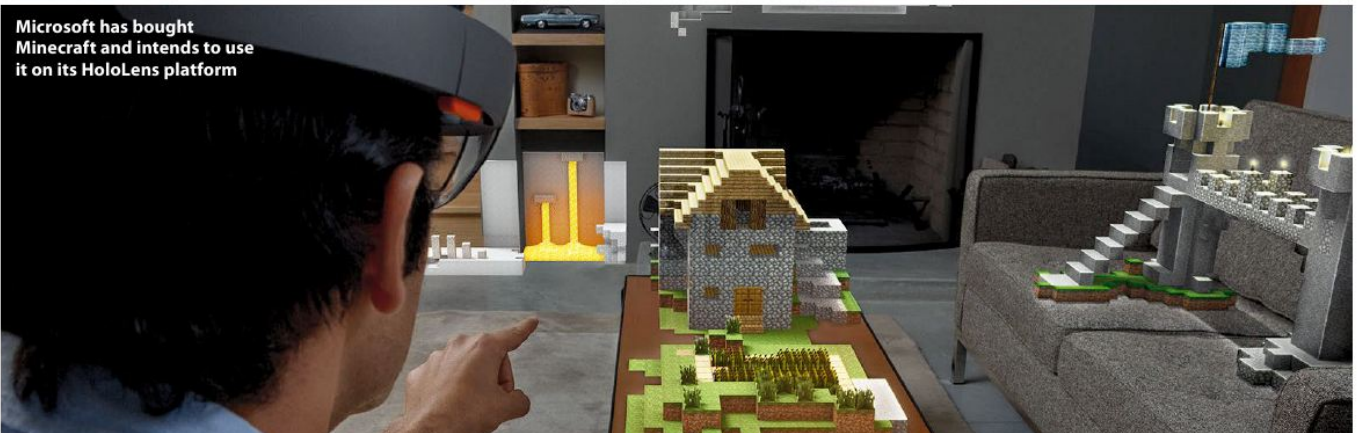
Blippar and Aireal want to push advertising in your AR experience



This is what the Magic Leap tech is intended to look like, in the office



A Magic Leap priority is being safe for kids



Microsoft has bought Minecraft and intends to use it on its HoloLens platform

WHAT ABOUT VR?

There are three projects nearing release. Project Morpheus, Vive and Oculus Rift. Of these, Oculus Rift is the oldest, and several developer iterations have been released. A cut-down version of it made to work with Samsung mobile phones, the Samsung Gear VR, has already been released. It works by slotting a Samsung Note 4 or Galaxy S6 into a viewing device and runs with 1280 x 1440 on each eye and a 96 degree viewing angle.

Despite that, there's still no sign of the Oculus Rift consumer model. The most up-to-date version, the Crescent Bay prototype, has a positional tracking camera for your head, low-persistence

OLED display and runs two screens at 960 x 1080 on each eye, at 90Hz, and a 110-degree viewing angle. No release date has been announced, but 2015 is likely.

Sony's Project Morpheus is the quickest-developed of the three. Like its AR solution, Sony seems more concerned with getting a working version of its tech to consumers than with making it the cutting edge. The version we tried in July last year was lower resolution and fidelity than the Oculus Rift versions we'd tried up to that point, but both companies have since improved their hardware. It has a similar OLED screen running at 960x 1080, a 100-degree viewing

angle, and a 120Hz refresh rate. It tracked our heads using the Playstation camera, and it had true 3D audio. It's due out in 2016 for PS4, which already has motion-sensitive controllers.

Valve and HTC's Vive headset is the most impressive. It recognises that some of the joy of VR is in interacting with those virtual worlds, so it does two things. First, it has a pair of bespoke controllers for you to hold, allowing limited interaction. Second, it has a set of cameras that sit in the corner of your room, detect your location and any obstacles, and track your movement, as well as setting the virtual world's limit at your real world limit.

Vive has two 1080x1200 screens running at 90Hz. As the screens are narrower, you'll have a wider vertical field, and it should be lighter as your PC will do all the processing work. Its big selling point is those two motion-tracking cameras, which are infrared and wireless, to follow the headset's 37 sensors. This enables you to roam freely in your room and the virtual world. Oh, it works with multiple players and should be out this year.

If you want to try VR today, you can get a casing for your mobile phone like the free Google Cardboard, or a cheap third-party headset like the £30 Immerse from Firebox.

You've almost certainly heard of Microsoft's contribution to the AR party – its HoloLens system for Windows 10 and possibly Xbox One. It seems revolutionary, but its use of the word 'holographic' might be suspect (and mainly due to affection for *Star Trek's* Holodeck). Kinect seemed revolutionary in the hermetic demonstration settings you get at big tech trade shows.

HoloLens definitely looks impressive from the screenshots scattered around these pages. It's a futuristic headset that superimposes 3D creations into the world and allows you to interact with them. The impressive element here is how high quality the images they produce are – from the videos and reports, it's utterly compelling, if nowhere near as immersive as the HTC Vive or the Oculus Rift.

The actual headset is a lot bulkier than a comparative AR headset, Google Glass say, but then this has the power of a true VR headset because it's not doing a simple 2D overlay. It reportedly weighs around 400g, is adjustable to all head

sizes and is totally wireless. It consists of holographic lenses, depth cameras and three separate processing units – one that is central, one graphics and also one holographic.

The depth cameras are built from the same tech as Kinect but are lower power, have a wider viewing angle and are placed around the front and sides of the headset. They track both the user's head and hands, as HoloLens is controlled entirely by gesture and voice, *Minority Report*-style. This lets you interact with the 3D virtual models of the apps, from building blocks in Minecraft, to sculpting the bodywork of a motorbike. MS is working on 'pinning', which will let you stick these models in place in the environment, so you can move around them, and 'holding', so you can pick them up and manipulate them.

The apps are really what wowed the press when HoloLens was announced. Microsoft recently bought Minecraft for \$2.5 billion, and it's already made a version of it that runs on HoloLens.

Similarly, NASA has an app that lets you explore Mars, and there's a version of Skype that runs on it so that a builder can explain to you why you should have spent more time in carpentry classes at school. Though the reports are mostly positive, the tech was in an early stage, and there were concerns over whether the hardware could fit into a consumer unit, and the regularity with which the illusion was broken.

That's not all, however, as Microsoft also has several other AR and VR projects underway. It definitely has an AR headset ready to go – Microsoft bought the smart glasses firm Osterhout Design Group in March 2014. And another project called RoomAlive was shown off in October 2014, consisting of a set of projectors that transformed the walls of an entire room into an interactive environment.

Digressing for a moment, there are also persistent rumours about a VR headset for Microsoft's Xbox One games console. After all, the *Wall Street Journal* said in March 2014 that the firm already had 3D



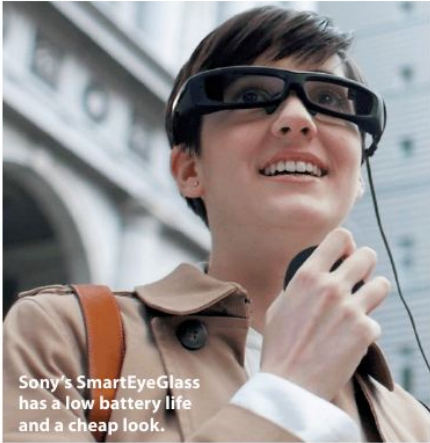
Valve's Vive has a Batman-style industrial look to it. It needs two base stations to work



HoloLens is a much smoother design, more 1950s or 1990s chromedome Cyberpunk



The final consumer Oculus Rift hasn't been seen yet, but it's aiming for ski goggle size



Sony's SmartEyeGlass has a low battery life and a cheap look.



HoloLens is intended more for business functions than entertainment



Magic Leap's stated aim is to reintroduce magic into our lives



With \$500 million in funding, Magic Leap can make any number of virtual seahorses.

virtual reality tech ready to go. HoloLens has reduced the chances of that coming to market, but we assume Microsoft has it ready as a back-up.

Google does it better

Google Glass was Google's high-profile effort in the field of AR, and you might argue it was its first high-profile failure, given that Glass has been removed from sale ahead of a redesign and a new model. The device is a set of (quite pretentious-looking) plastic and metal glasses, with an HUD display projected onto it and a smartphone-like processor behind it all, which was on sale for \$1,500.

Glass did everything you thought it should, like understand natural voice commands, record video, take photos, and all the update elements of your phone. It had a small touchpad on the side of the device, which let you browse a timeline of recent events. The screen was a Liquid Crystal on Silicon device with an LED-illuminated display that used polarisation and reflectors to bounce the image into

VIEW-MASTER ©DEIBY

your eye. It had a range of supported Google apps, including Now, Gmail, Maps and Google+. But it's now on a hiatus while a new version is being designed.

That's not all of Google's AR efforts though. It's also making simple AR games for its Android phones, such as Ingress – a massively-multiplayer location-based game built on Google Maps. And it has Project Tango in the wings. This is a standard tech for mobile devices that allows them to navigate the physical world in the same way humans do. It uses advanced computer vision, image processing and special image sensors to make an end-to-end navigation tech that understands its own 3D motion in the world, can perceive depth, and use visual cues about areas or objects they know to self-correct. At the moment, it's only available to core developers, but we assume it'll be integrated into next-gen Android hardware.

Magic Leap (www.magicleap.com) is another Google-funded project and a direct challenge to Microsoft's HoloLens.

This is being built by a team of tech and games industry veterans, including the author Neal Stephenson and the 3D team at WETA. Reports have it as more believable and solid than the HoloLens. It works using a virtual retinal display – that is, a display projected onto the retina.

Similar to HoloLens, the simulation looked utterly convincing. The animated 3D creatures it portrayed looked detailed and sharp, and sat well in the surrounding world. And similar to HoloLens again, it ran on a huge piece of hardware (essentially a PC) sitting nearby, rather than in the headset itself. It's worth looking at the promo video to see what it's capable of. Magic Leap hasn't been announced or promoted yet, but we're expecting it to launch in 2016 or 2017.

Sony's 'me too' tendency

The Japanese giant always seems to want to get involved in any new tech, but recently it hasn't been leading the market here. Its Project Morpheus feels like a 'me too' VR solution – but it'll surely work well



CastAR's prototype is the ugliest, but also the lightest-looking of the devices



It's striking how many of these headsets hark back to kid's toys like the View-Master



Sony's SmartEyeGlass is basically Google Glass, at half the price and with slightly worse software



on Playstation 4 and might sell well. However, SmartEyeGlass is its foray into AR. The currently available SmartEyeGlass SED-E1 Developer Edition is similar to Google Glass, though much cheaper at just \$840. It uses "holographic waveguide technology" in 3mm AR lenses, which produces something similar to Glass, with overlaid text and diagrams operating at 15fps. It also has a 3MP camera that can take pictures or video. It connects to Android phones by Bluetooth, and is controlled by a puck that sits on the user's lapel and doubles as microphone, speaker, NFC and battery – which comes in at only 150 minutes.

There haven't been any official reveals of Apple's research into VR, but Apple does have several patents for AR tech – there's one for a 'transparent electronic device' that sounds like an augmented reality device. Examples in the patent include using the device to overlay information about a museum exhibit. Interestingly, the device would be able to opaque itself, and only display selected elements of the background world, otherwise being a normal opaque LDC or OLED display.

There's a lot of hype around AR and VR at the moment. Hundreds of firms are trying out strange new tech to augment the sensation. For example, Bristol's UltraHaptics uses targeted ultrasound vibrations on a user's skin to form tangible shapes and textures from thin air, so the users can feel them without the need for worn equipment. That, combined with the hand-detecting Leap Motion device, makes for convincing sims, like brushing hands over ghosts. For VR,

THE AR HARDWARE

Not all AR devices share the same hardware and software, but there are basic aspects they do need. First, you need a processor, a transparent display to show the world and the projections, a light power source, plus sensors and input devices.

Sensors are mostly included as standard in mobile phones. An accelerometer lets you measure impetus, a GPS measures global location, and a magnetometer or solid-state compass measures the device's orientation against the Earth's gravitational field – that is, the

ground. Luckily, modern smartphones contain all of those things.

For AR technologies that aren't based on mobile phones, if you want these elements, they have to be built in, increasing the size and cost of the device. Sony's system has an external box clipped to the lapel, while HoloLens and Magic Leap have been demoed with tabletop external units. Input systems are another challenge. AR encourages users to be mobile with their hands free or holding interactive objects, which means the device has to be wireless.

we've seen every type of treadmill under the sun – giant balls, resistant pads, harnesses around the waist – anything to convince you you're in the virtual world.

Do believe the hype

On balance, the hype is justified. Too many big companies are competing here for this to not be a success for one of them. But challenges remain, and they're not insubstantial. The biggest are in shrinking the tech down to a headset, or headset and pack model; in maintaining persistent simulations while doing that; and in preventing object-placement errors. It's likely that, after all this experimentation, mobile phones will be the first devices that give us a taste of this.

As always in that field, Apple will be the firm to watch. That said, Google's Magic Leap investment is considerable enough and the tech advanced enough that we'd cautiously predict it'll be first to market, albeit in a reduced form.

One prediction we're happy to make is we'll look back at this, the way we now look back at the first mobile phones. This technology is going to revolutionise many things – anything that requires 3D knowledge, such as architecture; anything that requires management of data sets, like programming; and anything that just wants to look pretty, like art or video games. This is going to be the future. We just have to wait for the hardware to catch up. ■

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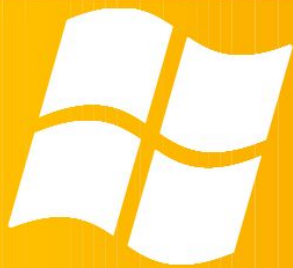
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Do you have a PC problem? Get in touch...

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Microsoft Office IS OFFICE 2000 COMPATIBLE WITH WINDOWS 10?

Q I'm currently running Windows 7 Home Premium with Office 2000 Professional. I've already reserved my free download for Windows 10, but I just wanted to confirm that all my current programs –

including Office 2000 – will be unaffected by the upgrade?
Alan Wynyard-Simpson



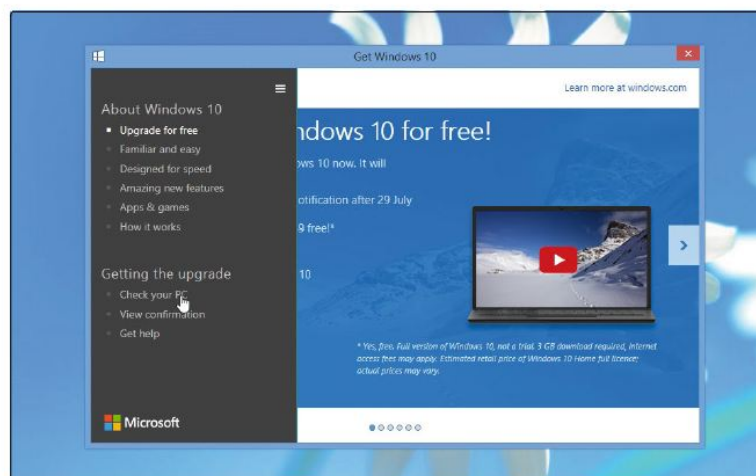
Graham's solution
Sadly Office 2000 isn't compatible with Windows 10 – or indeed Windows 8 before it, Alan. However, the good news is if you can't afford an upgrade to Office

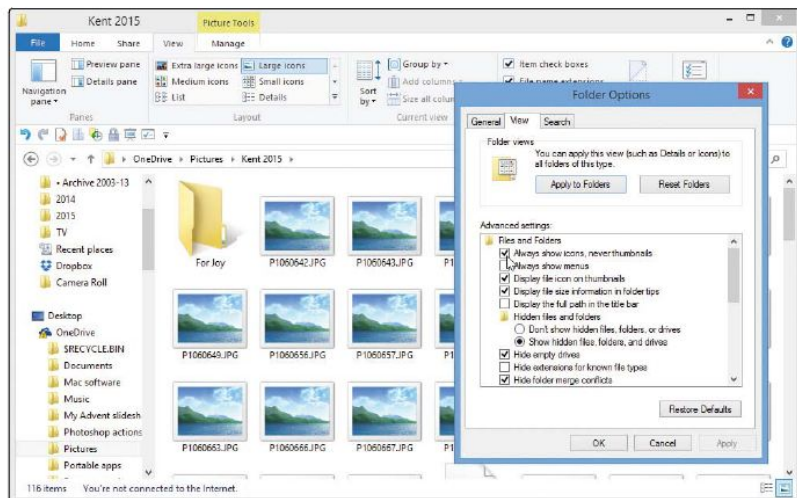
365, then there are a number of free Office alternatives available to you. Kingsoft Office Suite Free 2013 (kingsoftstore.com) is a good choice if you only need the core applications – word processor, spreadsheet and presentations tool – and are happy to use the same ribbon interface found in Office 2007 or later.

If you'd rather stick to the old menu-based system employed in Office 2000, then LibreOffice (libreoffice.org) is the best choice. This also offers a database plus drawing and maths tools in addition to the core programs.

To verify that your other apps will work in Windows 10, right-click the Windows logo in the Taskbar Notification area and choose 'Get Windows 10'. Click the hamburger like icon in the top left of the window to reveal a menu, and click the first option underneath the 'Getting the upgrade' section, which may read 'Your PC is ready' or 'Check your PC'. This will list your PC's readiness for Windows 10,

PRE-UPGRADE CHECK Get Windows 10 flags compatibility problems





MISSING THUMBNAI
Check the settings under Folder Options if your pictures display as icons

Quickfire questions

Is there a free program I can use to sync my iTunes library in Windows to my new Android-powered phone?
Beth Linmark

Browse to notpod.com where you'll find the free Notpod tool. You can use it to sync all or a subset of your iTunes collection to your Android phone – or any MP3 player.

Is **PC Services Optimizer's** Gaming Mode only useful for speeding up games?
Stu Porter

No, its Gaming Mode feature can be used to speed up any resource-intensive application, such as HD video editing or scientific modelling.

complete with any known compatibility issues you may need to address.

Windows HOW DO I RESTORE PHOTO THUMBNAI

Q Can someone please tell me how to restore the photo previews that appear when browsing my folders in Windows 8.1? All I'm seeing is the flower icon next to each photo.
Ken Payne

Nick O's solution
This can usually be fixed by tweaking a single setting. Click the folder button on the Taskbar to open a File Explorer window. Switch to the View tab on the ribbon and click the 'Options' button on the right, to open the Folder Options Control Panel. Switch to the View tab on here and check the 'Always show icons, never thumbnails' setting at the top. If it's ticked – as it was in Ken's case – remove the tick and click 'OK', which will restore the thumbnail view.

Internet WHY ON EARTH CAN'T I TRACK THE ISS?

Q This problem has plagued me for a year now and it's most frustrating. When I go to the Space Station's orbital tracking page at NASA (visit spaceflight.nasa.gov, then look under 'Realtime Data'), it loads okay, but the image of the space station does not move along the orbit. It used to work fine on my old Windows 98 PC with dial-up modem! You'd think with all the advances we're making in technology this wouldn't be a very big problem...
Jim Redford



Matt's solution
We trekked over to the site and discovered the orbital tracking facility

is basically an embedded **Java** application. We also encountered the same problem as Jim, and when we rolled our mouse over the space station image we discovered it was referring to a mission from last year, which coincided with when the tracker stopped updating.

Once we'd ascertained that NASA was no longer maintaining this page, we discovered a large number of online alternatives, none of which require Java, which is starting to fall out of favour with web developers due to security issues. We forwarded on the web links to Jim who was happy to use the isstracker.com website going forward.

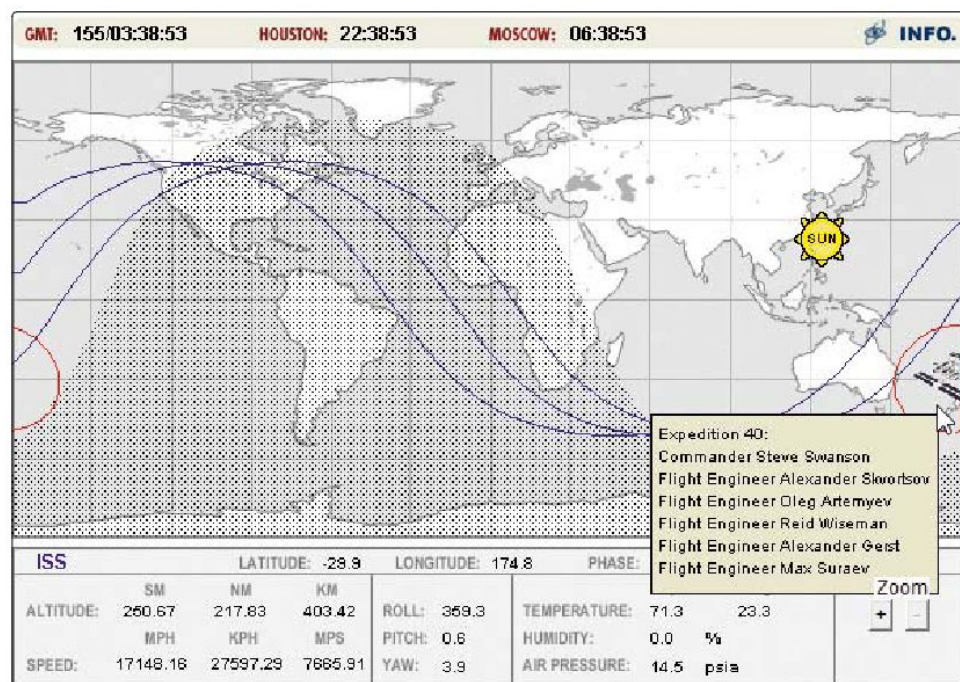
"Java is starting to fall out of favour due to security issues"

Jargon buster!

▶ Java
A programming language for computer platforms that can be embedded into web pages.

▶ PC Services Optimizer
A free program that speeds up PCs by disabling unnecessary services (smartpcutilities.com).

NO UPDATES
NASA's ISS tracking page hasn't been updated for months



Quickfire questions

Is there a quicker way to add items to the Quick Launch toolbar in Office 2010 other than using the 'More commands' option?
Paul Eastman

The quickest way to add any shortcut command to the Quick Launch toolbar is to locate the item in question on the ribbon, then simply right-click it and choose 'Add to Quick Access Toolbar'.

Is it possible to remove Windows Media Center in Windows 7? I have no use for it.
Graham Vine

You can't uninstall Windows Media Center, but you can effectively disable it: click 'Start > Default Programs > Set program access and defaults'. Expand 'custom', untick 'Enable access to this program' next to Windows Media Center and click 'OK' to finish the task.

Why does my Epson wireless printer take five minutes from powering on before it's ready for use?
Helen Faulkner

We eventually tracked the problem down to corrupt drivers – Helen removed them, then downloaded and installed the latest drivers from Epson, and now the printer starts up in a matter of seconds.

Windows RESOLVE WINDOWS UPDATE ERROR

Q I'm unable to check for Windows updates – it tells me "Windows Update ran into a problem" and returns an error code '8007041D'. Can you advise please?
Keith Hill



Jeremy's solution

Start by running the Windows Update fix-it tool – get it from support.microsoft.com/kb/971058. If the problem persists, then first try temporarily switching off your security tool's auto-protect feature to see if it's blocking Windows Update. And if that fails, try opening a command prompt window as an Administrator and running the following two commands in sequence:
DISM.exe /Online /Cleanup-image /Scanhealth
DISM.exe /Online /Cleanup-image /Restorehealth

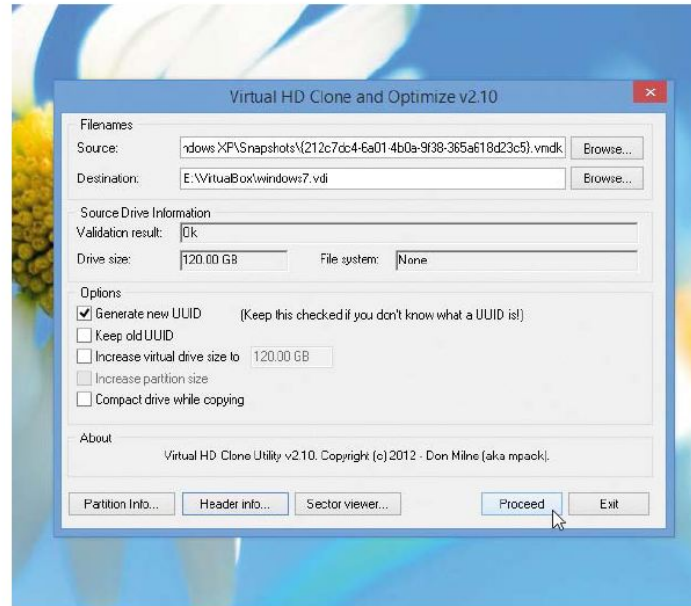
Software RECOVER VIRTUALBOX SNAPSHOTS

Q I tried launching VirtualBox this morning and it told me my Windows 7 machine was inaccessible. I've scoured the Windows 7.vbox file for clues, but all I can find is a reference to a current snapshot ID that doesn't exist. Is there some way I can recover my virtual machine with all its changes intact?
James Franklin



Graham's solution

Use the vbox file to identify the latest snapshot file linked to



RECOVER SNAPSHOTS This tool could be a lifesaver for VirtualBox users

your main drive – this is the one that contains all the latest changes. Using a free program called Clone VDI, you can take this file and produce a single file that contains the current state of your system by merging it with the original virtual drive. Note this will remove any snapshots attached to the virtual machine.

Download CloneVDI-exe.zip from <http://bit.ly/1GYK7iu>, then extract its contents and run CloneVDI.exe. Click 'Browse' next to Source and select your snapshot file. Then click 'Browse' next to Destination and select the folder (and name, which can be anything you like) for the new file. Click the 'Header info...' button if you wish to verify the snapshot is the correct one.

Click 'Proceed', then wait for the new file to be created. Once done, create a new virtual machine with the same attributes as your old one, pointing it to this new data

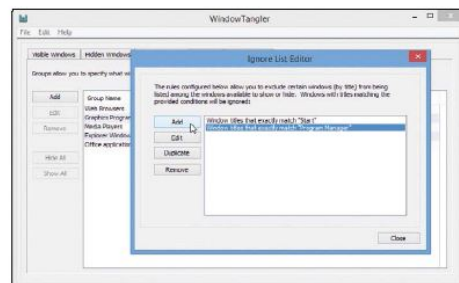
MAKE WINDOWTANGLER IGNORE WINDOWS

Q Is there some way I can exclude certain windows from being hidden by WindowTangler?
Valentyn Jasinski

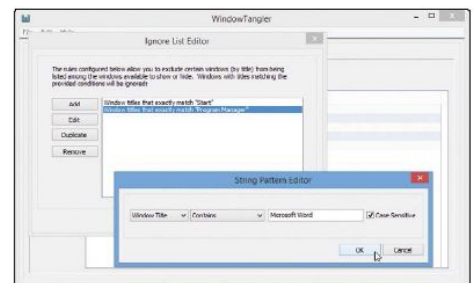


Nick P's solution

WindowTangler, which we featured last month, employs an 'Ignore List', which works in a similar way to groups – you can choose to ignore programs by the title that appears in their window (such as 'Microsoft Word') or the name that appears in Task Manager (winword.exe). Here's how:



1 Create new rule
From the main WindowTangler window, open the 'Edit' menu and choose 'Edit Ignore List'. You'll see two rules are already in place, designed to stop the program affecting two specific windows: Start and Program Manager. Click 'Add' to add yours.



2 Ignore by window title
If the program window is open, identify the program name – such as 'Microsoft Word' – and type this into the box next to the 'Window Title' and 'Contains' drop-down menus. Tick 'Case Sensitive' if necessary and click 'OK'.

file. You should find you can now run the latest version of your Windows 7 VM.

Internet WHY DO EMAIL IMAGES DOWNLOAD SO SLOWLY?

Q I've recently been afflicted by some kind of email issue – basically, any images attached or embedded to an email take much longer to download than they did previously. I'm running Windows Mail in Windows 7.
Theresa McHugh



Nick O's solution

We wrestled with this problem for quite some time, asking Theresa to try a variety of things before conceding defeat. Theresa dutifully continued looking for a solution and eventually traced the culprit to a program called LAN Optimizer, which was installed with her motherboard (Gigabyte). This free tool promises to provide "intelligent network management" to keep your internet connection running smoothly by ensuring any one application or process can't hog all the available bandwidth. Unfortunately, LAN Optimizer was being too zealous when managing the download of images. Theresa removed the utility and the problem immediately ceased; she's also noticed that images now load quicker in Internet Explorer too.

Microsoft Office BREAK TABLES ACROSS PAGES IN WORD

Q I'm putting together a book on the history of my old sport, with an appendix of championship results from 1966-2000. The Word 2007

document is 95 per cent tables, and my problem is that many of the tables start at different places on the page and sometimes split in the middle of the table when flowing on to the next page. What are my options for keeping things reasonably neat?

Gill Freeman

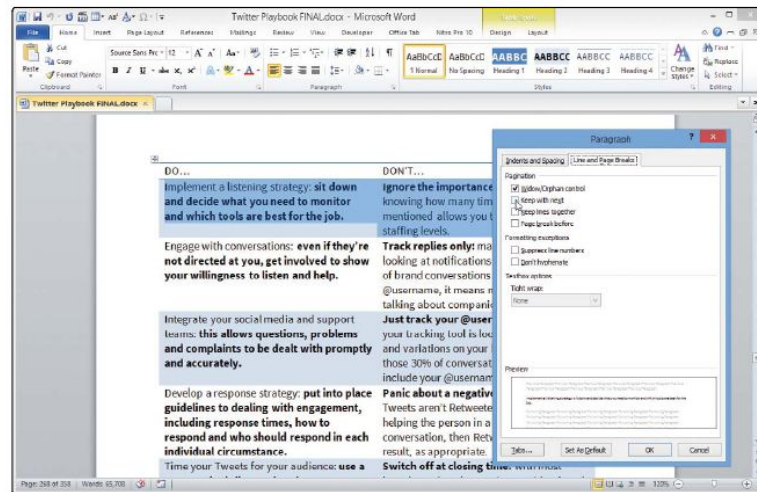


Nick P's solution

I took a look at Gill's tables and came up with three possible solutions: first, start each championship's results on a new page. With some tweaking of line spacing, as well as the spacing between each table, it may be possible to restrict each championship to a single page. Second, try inserting a manual **page break** between each sub-section, for example at the

end of a table of medals for a particular category. The third option is to simply ensure a break occurs between tables, so the text flows smoothly and while there may be breaks between categories, each individual category will be kept together on one page.

The tools you'll need to investigate all these options are found in the Paragraph dialogue box. Make sure you select the relevant parts of your table before switching to the Home tab and clicking the small arrow button on the Paragraph group to open it. Use the Spacing section on the Indents and Spacing tab to experiment with spacing, and Line and Page Breaks tab to control how the table breaks across pages. See wordribbon.tips.net/T012975 for a more details. ■

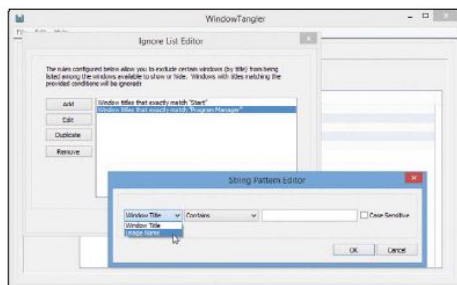


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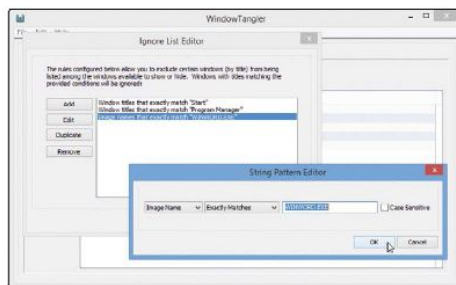
Email full details of your problem to the support team and we'll do our best to help: windowsmagazine@futurenet.com Or write to the support team and we'll do our best to help: **Support Squad, Windows Help & Advice magazine, Future Publishing Ltd, Quay House, The Ambury, Bath BA1 1AU**

TABLE FLOW
Use the Paragraph dialogue box to control your tables

"If the problem persists, temporarily switch off your security tool's auto-protect feature to see if it's blocking Windows Update"



3 **Ignore by image name**
Make sure the program is running, then identify its image name under the 'Process name' or 'Image name' column in Task Manager's Processes tab. Now switch back to Window Tangler and first change 'Window Title' to 'Image Name'.



4 **Complete and test**
Click the 'Contains' dropdown menu and change it to 'Exactly Matches'. Now type the program's process name into the empty box and click 'OK' followed by 'Close'. Test your Ignore rules are working, tweaking the settings if necessary.

Jargon buster!

▶ Page break

A marker that's added to a Word document to indicate any content placed beneath the break should start on a new page. Often used to mark the end of sections like chapters to simplify text flow.

▶ Snapshot

A file used in the creation of backups of virtual machines. Snapshots allow users to roll back the machine to a previous point quickly and safely.



Upgrade

► NEW HARDWARE ► ESSENTIAL ACCESSORIES ► LATEST GAMES

Welcome



When it comes to tech, size matters. And for us that means larger than life as well as compact. Over on page 88 we review the Toshiba Canvio external hard drive, which has not one, but three terabytes of storage. We also put the super-slim HP Spectre through its paces, plus take time out with *Heroes of the Storm* – a big game that’s kept us busy!

With September nearly here students will want to take the latest Windows 10 tech to class – read our round-up of six stylish machines on page 82. And if your studying days are long gone that still doesn’t mean you can’t treat yourself... until next time!

Nick Odantzis deputy editor
nick.odantzis@futurenet.com

This issue's highlights



82 Laptops and Ultrabooks

Need a new laptop to run Windows 10? Browse the net or enjoy the latest films and games with these stylish, portable machines



84 HP Spectre

Could this sublimely thin 2-in-1 be the first transforming laptop to finally strike the perfect balance?



88 Toshiba 3TB

Introducing the gadget that’s compact, roomy, fast... and expensive. Find out more with our full review



90 Heroes of the Storm

An entertaining game that busts out of the multiplayer online battle arena genre, and welcomes new players with open arms

Our review guarantee

We use only acknowledged experts to review products, so you can use our ratings with full confidence to make your buying decision

How we review

One of the key tenets of our review philosophy is that hardware should be compared against like products wherever possible. It is only when you pit the finest products of a certain type against one another – at the same time – that you can really come up with a definitive

verdict as to which is the very best in that category. The pace of development in computer hardware means that it is very difficult to compare scores from today with those from, say, six months ago. Magazines and websites that review a new product on its own run the risk of confusing or misleading.

We guarantee to test every piece of hardware rigorously and thoroughly, using only acknowledged experts to establish the worth of a product. We always review from the viewpoint of our readers; the day-to-day practicality and quality of a product is paramount.

Our awards...



Only the very finest products receive our Best On Test Award. These will have excellent marks for quality.



Our Best Value Award is given to products that quite simply represent the best value for your money.

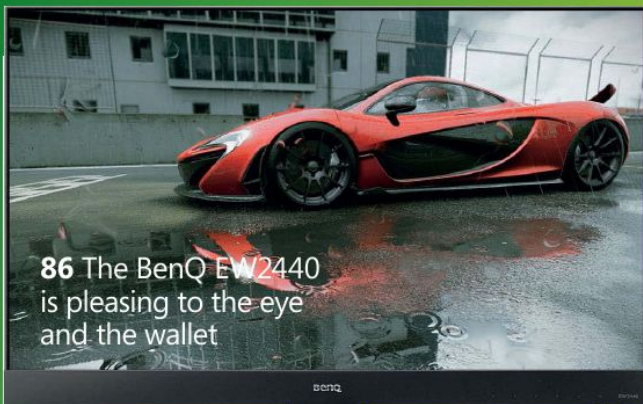
RATING EXPLAINED ★★★★★ Superb ★★★★★☆ Very good ★★★★★ Good ★★★★★ Disappointing ★★★★★★ Poor

Full listing

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- 88 Toshiba 3TB Canvio external hard drive
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- 94 Kerbal Space Program 1.0
- 96 Magicka: Wizard Wars



84 A great 2-in-1 machine for work as well as play



86 The BenQ EW2440 is pleasing to the eye and the wallet



"The best £30 you'll spend on a game"
Turn to page 94

Our promise to you...

The Upgrade section is your key to finding out about the latest products, all designed to help you get more from your PC

You can trust our reviews

✓ Our expert reviewers are 100 per cent independent, with years of experience in the world of computing. Our rigorous testing procedures mean that only genuine, high-quality products are awarded high star ratings. Further, very few are handed our Best Value or Best on Test Awards. If you see an item of hardware bearing one of these marks, you can be confident that it is an excellent product. Always check when the award was given, to ensure it is still up-to-date.

We choose the best products

✓ Thousands of new products for your computer are released every year and choosing between them can sometimes be an impossible task. Our experts select only the best hardware and software to feature in this magazine, making your decision on which one to choose easier. Even better, our awards and star rating system make it simple to find the best products for your needs, with our recommended products section giving you a fast, trustworthy guide to a wide range of hardware and software.

We'll introduce you to new stuff

✓ Wherever we can, we review new hardware comparatively, pitching it head-to-head against other similar products. (Full details of our policy can be found in the opposite page, under 'Our review guarantee'.) Of course, this isn't always possible with new products and part of our duty to you is to introduce you a wide range of fascinating new hardware, software, services and games.

The reviews of standalone hardware and software are just as thorough as our comparative reviews. However, we do not allocate scores to them because this can often be misleading. The only exception to this rule is on our games reviews, where the pace of change is a lot slower and single scores can be genuinely useful.

WINDOWS 10 LAPTOPS

Need a new laptop to run Windows 10? Browse the internet or enjoy the latest films and games with these stylish, portable machines

Windows 10 works on most old hardware, but you might see upgrading as a good excuse to get a new laptop, anyway. Today's portable computers are so slim and elegant, they wouldn't look out of a place on a catwalk. But it's not all style over substance: fitted with Intel's latest (in some cases, fanless) processors, the top laptops and Ultrabooks offer impressive power and versatility.

What's more, those that offer 2-in-1 capability enable you to transform your machine from an office to a home cinema, with the mere swivel of a screen or the detachment of a keyboard. Introducing our super six...



1 Apple Macbook

From £1,049 www.apple.com/uk

Need to run Windows on a very portable Mac? At just 13.1mm thick, Apple's new MacBook is the brand's slimmest laptop yet. It won't suit everyone due to its single USB Type-C port, which means you'll need an adapter to use your old monitors and peripherals – but it crams in some top tech. A 2,304 x 1,440-pixel Retina Display accompanies a unique 'butterfly' keyboard that reduces key wobbling, a Force Touch trackpad that adds a third click and haptic feedback. Even better, it's fanless, silent and lasts up to nine hours on a charge. Grab it in Gold, Silver or Space Grey.



2 ASUS Zenbook UX305

£650 www.asus.com

The UX305 doesn't cost a bomb and it's slimmer than the MacBook (it's just 12.3mm). It also packs Intel's latest fanless processor and crams in two full-size USB 3.0 ports, along with an HDMI output for hooking it up to a monitor or TV. The 13-inch Full HD display's matte coating avoids sun glare when outdoors and the battery life of up to six hours means you won't have to keep going back into the house to charge it up. A fast 128GB SSD and comfortable keyboard add to the appeal.



3 HP Spectre x360

From £849 www.hp.com/uk

Few laptops literally bend over backwards for you, but this will. A rotating hinge enables the keyboard to flip 360 degrees, so the machine can be used as a tablet or stood upright for watching video hands-free. Thanks to the Intel Broadwell chip inside, the Spectre x360 boasts a competition-smashing 12.5-hour battery life and crisp 3D graphics, while its solid aluminium body is almost tank-like in durability. Backed up by 8GB of RAM, it'll let you edit images and chew through demanding tasks with ease. See our full review on page 84.





4 Lenovo Yoga 3 Pro

From £999 www.lenovo.com/uk

The Yoga 3 Pro screams boardrooms, luxury cruise ships and complex Scotch whiskey. Its sharp 13.3-inch touchscreen spins 360 degrees around a watchband-inspired hinge made up of 813 individual pieces of aluminium and steel. Thanks to its flexibility and lightness, the Yoga can be used as a laptop, tablet or upright display, and the ThinkPad-inspired keyboard is one of the best around. Lenovo's Harmony software, which optimises settings depending on how you use it over time, means it'll adapt to you.



5 Dell XPS 13

From £849 www.dell.com/uk

This is a smartly designed laptop that stands out from the others here due to its gorgeous 13-inch edge-to-edge 'Infinity' display. Its border is so thin that it's virtually not there, creating a cinematic effect that's perfect for watching movies and videos. The XPS 13's clever screen also gives it a small footprint, making it incredibly bag-friendly and the opposite of a table hog on transport. While it's no gaming monster, the inclusion of Intel's latest HD Graphics 5500 solution means you'll certainly be able to run less demanding titles. *Frogger*, anyone?



6 Asus T300 Chi

From £800 www.asus.com

The Asus T300 Chi is a 2-in-1 machine that combines the best bits of a laptop and a tablet. The touchscreen magnetically detaches from the keyboard with a sharp tug, meaning you can sit back and use it to stream movies on the couch or prop it up against the wall to watch footie in the bath (keep an eye out for those bubbles). The Chi's razor-thin aluminium design is as impressive as any competing Ultrabook, making it stylish, versatile and portable. It's quiet and nippy, too, thanks to Intel's latest fanless chip under the hood. An impressive option for the money.





Could this actually be the first transforming laptop to finally strike the perfect balance? Unlike other hybrid notebooks, this 13-inch machine looks like any other laptop. But in one quick motion, you'll be able to flip the screen back 360 degrees to turn it into a full-on Windows 8.1 tablet.

Looks aside, it's a good, solid, 13-inch laptop complete with an Intel Core i5 processor and a flex-free keyboard to boot. HP has finally arranged the ultimate marriage between laptop and tablet to make this premium hybrid all for a reasonable price.

The outside shell is minimalistic with almost no embellishments on the plain, anodised aluminium chassis. It is a marvellously thin device that measures only 0.63-inches thick. Things get interesting when you open up the laptop – you'll notice the wide trackpad. Nearly double the width

Y
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wh
browsing to playing
of *Hearthstone* with the quality settings at their highest. As if that wasn't impressive enough, you can squeeze a decent amount of battery life out of it, too.

The convenience of the Spectre's 2-in-1's transforming

way to lighten the load for a better tablet experience.

But the silver lining is the HP Spectre x360 has one of the best screens we've seen on a laptop. The display offers some great viewing angles backed up by a

KEY FEATURES

Spectre x360

Manufacturer HP
Operating system Windows 8.1 64-bit
CPU 2.2GHz Intel Core i5-5200 (dual-core, 3MB cache, up to 2.7GHz with Turbo Boost)
Storage 256GB SSD
RAM 8GB DDR3 (1600Mhz)
Graphics Intel HD Graphics 5500
Ports 3x USB 3.0; HDMI, mini DisplayPort, headphone/microphone combo
Connectivity 802.11ac (2x2) and Bluetooth 4.0 combo
Weight 3.26 pounds
Screen size 13.3-inch, 1,920 x 1,080 FHD Radiance LED-backlit touchscreen
Camera HP TrueVision Full HD WVA Webcam (front-facing); Integrated dual digital microphones



with a great display, we had no problem using it outside, even on a sunny day. It comes as a complete package and makes this laptop truly a take-anywhere option.

The laptop's downward-facing speakers are equally impressive. Even with the laptop on our legs, music played through the covered speakers had clarity. They don't have a tonal range as

**"We had
which r**

headphones, but the built-in tweeters do a fine job.

We particularly enjoyed watching *Game of Thrones* on this machine. Thanks to the excellent display, we could discern dark details, while the speakers clearly projected everything from gravelly dialogue to the sharp clash of swords.

With a lean machine like this, we'd expect to get four to five hours of lasting power. And so, it came as a surprise to get just under six hours of battery life out of it. While that might not sound too impressive, bear in mind we put it through a gauntlet of tasks including streaming the last episode of *Game of Thrones*, a handful of *Hearthstone* games and

in-house cloud network, which lets users save unlimited files under 100MB.

Final verdict

Together, HP and Microsoft have put together one of the sharpest looking 2-in-1 convertible laptops ever. Without any prior knowledge, most people would think the HP Spectre x360 was nothing more than an attractive, all-aluminium laptop.

Thanks to a pair of well-engineered gear hinges, the transforming element of this laptop adds barely any weight (which is just as well), no awkward proportions or clunky mechanics. Instead, it inherits the added flexibility of a 2-in-1 machine;

letting you use it more ways than just on your lap.

There's a lot to like about the HP Spectre x360. The all-aluminum body is solid and sleek.

Performance is more than adequate for anything you might need to do from word processing to image editing to playing a few games. Frankly, the overall showing is pleasing, with a glossy screen that's a joy to use and enjoy media with a decent pair of speakers backing it up.

And that's just using the Spectre x360 as a laptop.

Transforming this machine with the smooth hinges is a cinch. The same hinges also hold the laptop in any mode you wish. As a tablet, the Spectre x360 is an excellent, albeit heavy, handheld computing device. Alternatively, the extra modes and ways in which you can orientate the screen makes it easier to set up as a personal screen when you're in a tight spot.

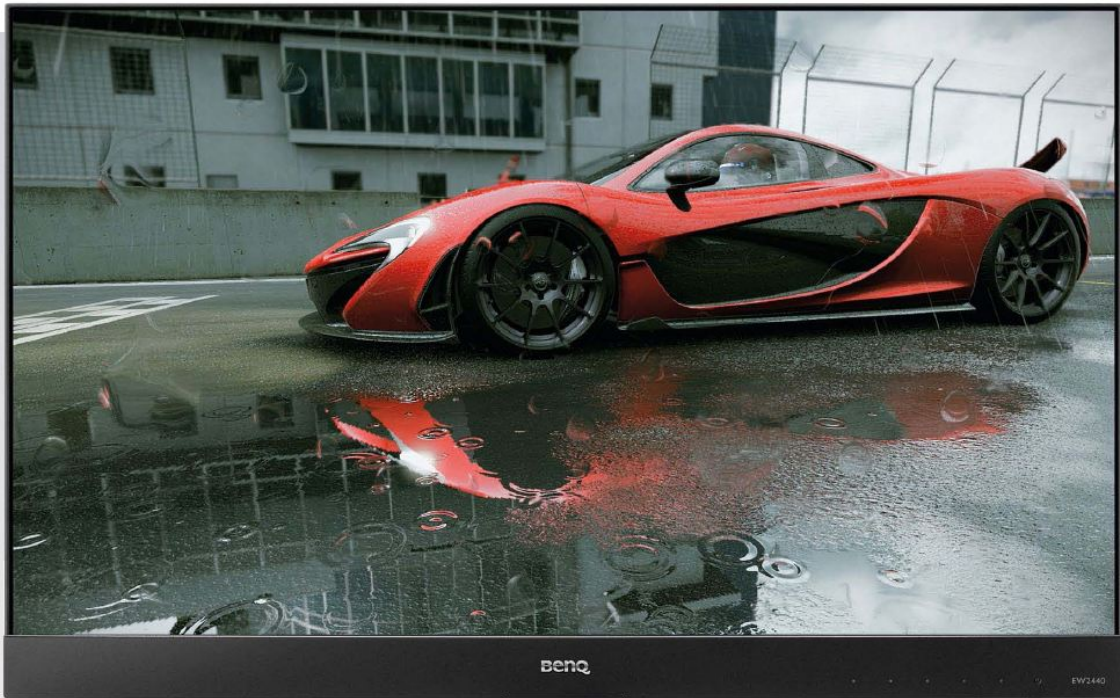
We say buy it. It comes highly recommended with an excellent 1080p screen, solid performance, good battery life, and sturdy build quality; all for an excellent price.

The Spectre x360 is one of the best-looking and powerful devices HP has ever produced and well worth a look over the many other 2-in-1 laptops. ■

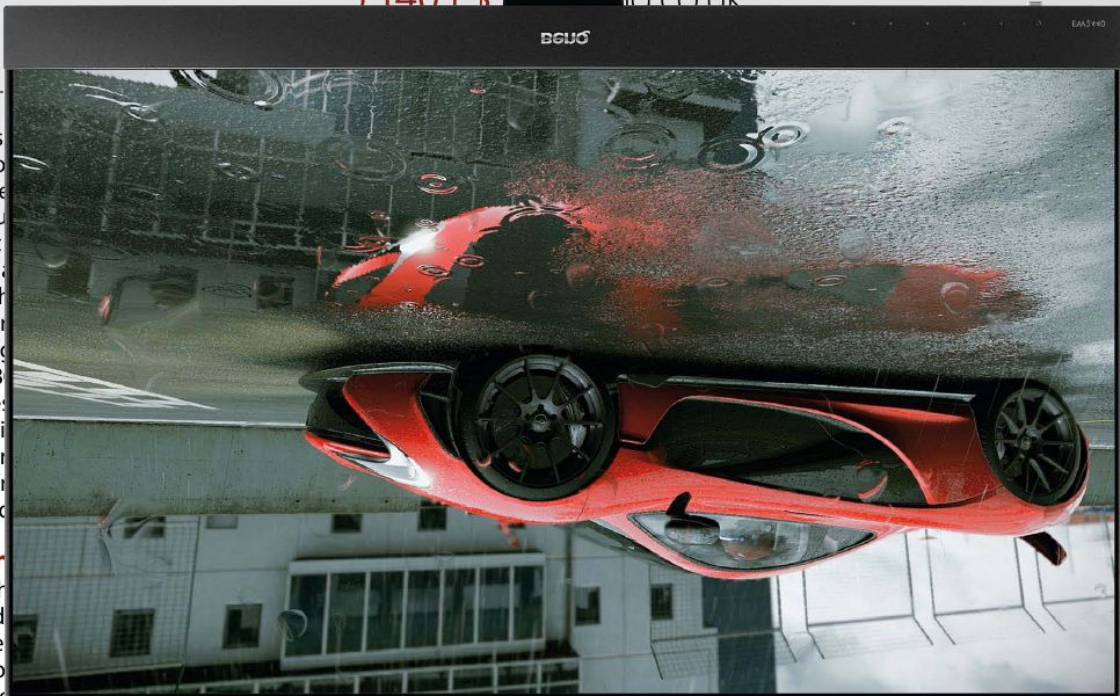
All the makings of a great 2-in-1 machine with a stylish chassis and excellent screen.

 **Windows
Help & Advice
Verdict**





BenQ EW2440
£140 | \$399



BenQ has a touch to golden the tone is superior monitor that professional aesthetics. They have the most option, though. With a 1080p resolution, the EW2440 does such as 3D display calibration or. Instead, you'll accurate rendering.

Design and

It arrives in the – base, stand manufacture once assembled.

Even though there isn't a cable management system on the EW2440, a vertical strip at the rear accommodates input ports. You will get two HDMI ports, with one of those supporting MHL for

panel exhibiting a small amount of light leakage along the edges. This isn't a problem when viewing images with brighter backgrounds, but it becomes obvious with movies set against a dark backdrop.

you to stand your phone on the dock and connect the MHL HDMI cable to project the content from your device to the larger monitor.

The obvious use for MHL output – which is supported on modern

in the adequate ops, and

one of nections, 0 is that smartphone enQ cable, to eably ng is a audio h to pick

the EW2440 astic.

it creates enables

KEY FEATURES

BenQ EW2440

Manufacturer BenQ
Features Smart Focus, Advanced Motion Accelerator (AMA) technology, EyeCare Utility, Flicker Free technology, HDCP, Low Blue Light Mode, Mobile High-Definition Link (MHL), SUPER Resolution, Senseye 3 Technology
Tilt -5 to 20 degrees
Response time 4ms
Contrast ratio 3000:1
Brightness 250 cd/m2
Size 24-inch diagonal
Display type VA LED-backlit LCD
Resolution 1,920 x 1,080 full HD, 16:9 aspect ratio



flagships like the HTC One M9, Samsung Galaxy Note 4 and Sony Xperia Z3 – is to enjoy videos and games. Given that the EW2440 also comes with built-in speakers, users should be able to enjoy multimedia by connecting the MHL cable.

Because it doesn't support VESA mounting or vertical or horizontal adjustments, the display is geared more toward home users. Even though users can tilt the angle of the display, the stand doesn't allow the monitor to lift or lower, or to swivel from left to right, for more

fatigue over long durations. BenQ's VA LED panel allows the screen to be flicker-free, even on low brightness settings, and comes with the same, wide 178-degree viewing angles as IPS displays.

Preset display modes

The EW2440 offers several preset display modes to make it more comfortable to read web pages, view documents, watch multimedia content and work under office lights. These modes are found in BenQ's Low Blue Light menu.

"Flicker-free technology and various preset display modes help reduce eye fatigue"

comfortable ergonomics.

That said, with a flicker-free technology and various preset display modes that help to reduce eye fatigue by removing blue light, the EW2440 does a good job keeping users comfortable while looking at the display for extended periods of time, especially at lower brightness levels.

When you lower the brightness on some IPS LED panels, the refresh rate also slows, resulting in the screen flickering, which can lead to headaches, eye strain and

The settings change the amount of blue light on the display. Even though there is conflicting scientific opinion on the causal relationship of blue light and eye fatigue, we noticed that with the web or reading modes enabled, the whites on the screen warmed up. Rather than a cold, blue white, white backgrounds appeared more yellow, taking on a similar hue as parchment paper.

This, in effect, serves to reduce screen contrast, making for a more comfortable reading experience

over longer durations. It felt more like reading printed text on paper.

Final verdict

The BenQ EW2440 is a stylish and affordable 1080p display providing eye comfort for those who spend most of their time staring at digital windows. The flicker-free technology and low blue-light screen modes help reduce eye fatigue.

The great colour accuracy and rich, deep blacks keep you focused on your content. This near bezel-less display delivers excellent colour accuracy and uniformity, contrast, and a wide range of colours. Given its affordable price, you can't fault the EW2440 for its plastic construction or uninspiring design. The biggest gripe with this display is that we couldn't get audio out from our devices to the display's built-in speakers over HDMI, MHL or a 3.5mm audio cable. It's unclear at this time what the problem was, and BenQ is researching the issue. For gamers, slower refresh rates will result in ghosting when playing games with high frame rates.

The EW2440 joins a crowded space of 24-inch full HD monitors. At the price, this won't be the cheapest 24-inch screen on the market, but if you're willing to pay a little more, you'll be rewarded with a great display. ■

Excellent colour reproduction, and refresh rates to help you stay productive and entertained.

 **Windows**
Help & Advice
Verdict





Toshiba 3TB Canvio Basics external hard drive

Introducing the most compact and most expensive

You don't need to convince us – we already know it's hard to get too excited by hard disk drives and storage in general. However, the latest addition to Toshiba's Canvio Basics range really will bring a smile to your face. The HDTB330EK3CA, to give it its formal title, is the first 3TB 2.5-inch hard disk drive (internal or external) to appear on the market.

We realise that it's a lot of storage, and who needs precisely that much anyway? To put it in context, it can store 857,000 digital photos, or 789,000 digital music files, or 2460 downloaded digital movies.

The current crop of external, pocket-friendly hard disk drives such as Western Digital's My Passport Wireless, the LaCie Fuel wireless, the Seagate Wireless Plus and Toshiba's own Canvio topped out at 2TB

plug the bundled cable in a mini-USB 3.0 connector, which is located on one side.

As with most hard disk drives in this category, there are no power buttons and no bundled software; plug-and-play at its simplest.

We'd certainly suggest you check out some decent back-up software to give an extra layer of security to your files. There are many available for free, so give some of them a whirl to find out which one suits your needs.

One thing's for sure, this drive is no slouch. Perhaps because of the high areal density and the number of platters used – this is a four-platter model, each with 750GB capacity, with 16MB cache and a 5400RPM spinning speed. It goes without saying that the Toshiba 3TB Canvio performed particularly well, sometimes matching faster spinning drives (such as the HGST Touro S) or even desktop drives –

KEY FEATURES

Toshiba 3TB Canvio external hard drive

Capacity 3TB1

Interfaces USB 3.0 (backwards compatible with USB 2.0)

Interface Transfer Rate: Up to 5 Gb/s (USB 3.0)4, up to 480 Mb/s (USB 2.0)

Speed 5700 RPM

Average Seek Time 14 ms

Cache Buffer 32 MB

Size (mm) 129x42x167



and all this without getting exceedingly warm to the touch or vibrating too much. When benchmarking, we saw Crystal DiskMark sequential read/write speeds of 143MBps/136MBps, and in PCMark 8 the drive achieved a storage score of 2038.

These scores are a significant improvement on the 2TB version of the Toshiba Canvio or the WD

therefore, the same strong points remain – it is a capacious device despite its diminutive size, one that is surprisingly portable and very fast compared to its predecessor. However, we felt it could do with a power button, which is something we noticed last time on the Canvio 2TB. As for the price, it is still far too high for our liking but then again,

“It goes without saying that it performed well – one thing’s for sure, this drive is no slouch”

MyPassport 2TB. This drive did, however, lag behind the Touro S on a couple of specific tests but the latter spins at 7200RPM.

Onwards...

Toshiba didn’t change a lot from the previous model; only the finish (from glossy to matte) and the hard disk drive were swapped. Not surprisingly

the Canvio 3TB has no rivals for now, so Toshiba can dictate the supply.

This latest addition to the portable Toshiba Canvio family shows that the Japanese company wants to remain competitive in a market where spinning hard disk drives are gradually being pushed out by solid state drives.

When Western Digital introduces a similar 2.5-inch 3TB hard disk drive to the market in the next few months, we think it is likely to bring down the price of the Canvio 3TB.

Until then, Toshiba’s latest addition reigns supreme in the land of high-capacity, low-volume external hard disk drives and if the price premium is acceptable to prospective buyers, then there’s no reason why they shouldn’t look at this drive.

The only 3TB 2.5-inch drive on the market packs more bytes per unit volume than any other drive.

 **Windows**
Help & Advice
Verdict





Heroes of the Storm

A bridge-building ambassador for its genre

Price Free (with in-game purchases)
Developer Blizzard Entertainment
Publisher Blizzard Entertainment
Multiplayer Yes **DRM** Steam **Web** www.battle.net
Recommended specs Core i5/FX Series; 4GB RAM, GTX 970/HD 7790; 10GB storage

 Let's start by saying this is not just another multiplayer online battle arena. It's a comment on the MOBA itself, by the company whose games inspired the genre. With it, publisher Blizzard steps into a territory it will find both deeply familiar and alien – a world of chunky characters and competitive strategy that it embraces, alongside a world of fathomless homebrew complexity that it doesn't. This is a studio that's always valued accessibility, a belief strengthened of late by the success of *Hearthstone*.

It'll be divisive, that's for sure. In designing *Heroes*, Blizzard has stripped away many ideas that previously defined the genre. Individual levelling is gone, replaced with a team-wide experience bar. Gold is gone, and with it items that boost your character's powers. Strategic drafting is gone, at least until you complete the long climb to competitive ranked play. For the majority of players, *Heroes* is a game where you pick who you want to play, click 'Play', and play.

Doing so places you in a team of five fantasy heroes

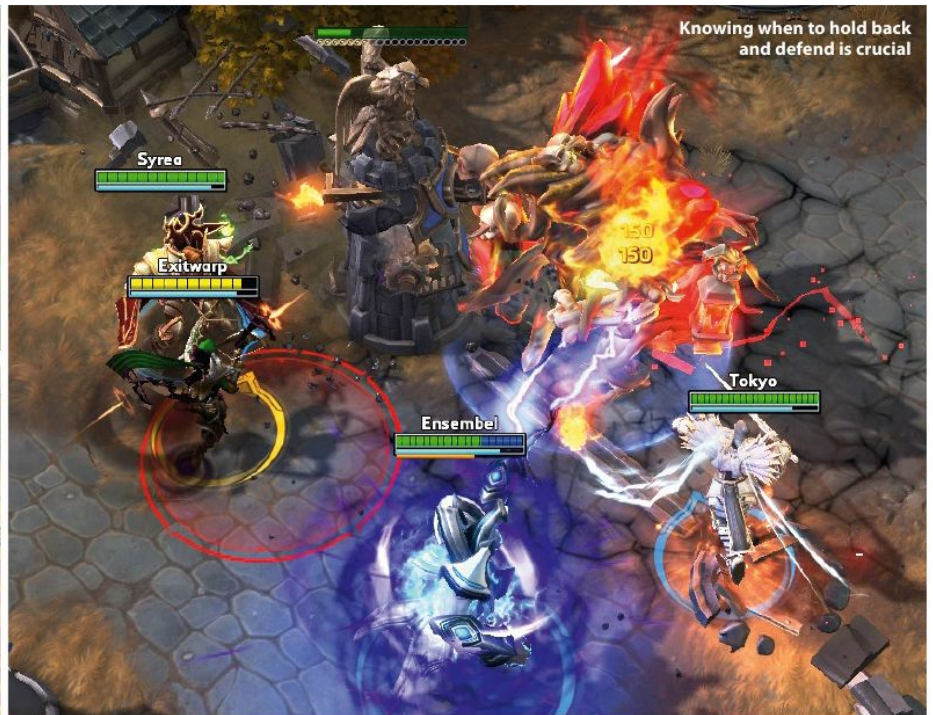
drawn from Blizzard's wide roster. Victory means pushing the gateways, towers and fortresses that amount to your opponent's outer defences, and when one team's core falls, the game is over.

There are seven maps at present, each of which offers a different layout and set of objectives. In *Sky Temple*, capturing shrines and defeating guardians grants your team a building-felling laser weapon. In *Blackheart's*

Bay, collecting coins for a ghostly pirate allows you to turn his cannons on your enemy. In *Haunted Mines*, the titular caverns amount to a side-dungeon where you gather undead skulls to power up your hulking golem.

Diverse as individual objectives are, they amount to the same thing – a reason to fight elsewhere. Sit in one place clicking minions and you'll be quickly overwhelmed as your opponent takes control of the map, and with it the neutral monsters and bosses that can be defeated and recruited.

All heroes begin with three abilities alongside a passive power (though these sometimes have an active component) and earn an ultimate when their team reaches level 10. It often feels like entering a *Dota 2* match in the middle, and within 15 minutes you can be playing out battle scenarios that would amount to the endgame of a 50-minute epic elsewhere.



These scenarios are likely thanks to a generous number of comeback systems. Games rarely feel lost within the first few minutes. Teams that are behind receive bonus experience, and the plurality of objectives means there's almost always something you can do to turn your fortunes around. You just need to work out what it is.

Easy access

These decisions make *Heroes* the most accessible MOBA we've played. They amount to a striking simplification of the genre's vocabulary, boiling the most opaque sector of competitive gaming to a handful of verbs: attack, defend, capture, collect. It opens up the basic strategic pleasure of five-on-five fantasy battle to an audience that might never have tried it.

Coming to *Heroes* as players already heavily invested in this genre, we've found our attitudes continually shifting. There are times when we've felt like a rally driver on a go-kart track, yearning for a game where failure is more significant and victories mean more. We suspect this will be the experience of many MOBA players. The more cynical will write it off entirely.

But we don't think that's fair. As much as it truncates the genre, *Heroes* preserves strategic concepts that are

more advanced than those it's removed. Items, skill builds and so on are all knowledge barriers. With perseverance, every player will eventually move past them. In knocking down that barrier, Blizzard has created a game entirely about map control, timing, momentum, and combat finesse. Mastering them can only come with experience.

One of the ironies of its accessibility is that, in removing the obvious impediments, *Heroes* drops new players in the strategic deep end. Given the amount going on in any given map and the apparent 'looseness' of the laning system, it's easy to lose matches quickly and not really know why. Play purely as a 'hero brawler' and you'll find yourself outmanoeuvred by players who understand there's a time to fight, a time to hide and a time to sweep the map.

These considerations are just as compelling as 'what item do I build next'. *Heroes of the Storm* loses out in terms of complexity and the creative potential that comes with it, but does an impressive job of introducing new players to the map-wide strategic element that makes these games so compelling. It may stumble, but not because it's accessible.

Although the feel of the game has improved since we first played it at Blizzcon 2013,

Heroes doesn't match the high standard Blizzard has set elsewhere. This is particularly apparent in the case of the *Diablo* heroes – in their original incarnations, these are defined by the damage they dish out, by the sense of force imparted with every click. In *Heroes*, that edge has been stripped away.

Power-down

Heroes of the Storm's avatars occupy far more screen-space than their equivalents in *League* or *Dota*, and, combined with much smaller maps, this gives the sense of being a bigger kid in a smaller sandpit. On the other hand, abilities feel muted: stuns are short, damage is low, particle effects simple and brief. These two factors contribute to the sense that your individual power is limited.

Heroes doesn't live up to the best of Blizzard's visual work, either. These games have always looked like a teenager's sketchbook given life, but now it feels like it's been through the corporate photocopier one too many times. Blizzard's latter-day love affair with PopCap is evident in the detail but this doesn't make up for the general lack of atmosphere. The *StarCraft*, *WarCraft* and *Diablo* universes, when seen through the same technical filter, lose their distinctiveness.

It is also, at present, a little too eager for your time and money. Although the worst excesses of account-wide levelling were excised during the beta, you still need to grind away to unlock every talent and skill, and if you want to play outside of the rotation of free heroes, then you're looking at a week of daily quests to save up enough gold for one or two characters of your own. Unlocking ranked play takes about 40 hours – double that if you're not using a premium booster. It feels like a misstep in a game that otherwise doesn't provide you with many ways to gauge your growth.

Blizzard has created a MOBA that doesn't require too much time for you to get something from it. The benefit for newcomers is obvious. The benefit for MOBA players is more subtle. We have a fit ambassador for the genre, this will be the game to convert others to the genre. ■

Entertaining and deep, this will surely open up a complex genre to a new audience.



Project Cars gives you wings. Lots of them

Project Cars

Some say it's the greatest racing game ever...

Price £40 | \$50

Developer Slightly Mad Studios

Publisher Slightly Mad Studios

Multiplayer Intel Core i7-3700/AMD FX-8350; 8GB RAM; GTX 600 series/AMD HD7000 series

DRM Steam **Web** www.projectcarsgame.com



PC racing games tend to fall into two camps. You could either have great visuals but dumbed-down realism courtesy of a typical *Grid* or *Need for Speed* instalment. Or, you can have the likes of *Live for Speed* or *SimBin's GTR* series, which would challenge driving talent, but be less concerned with taxing your graphics card.

The rich realism and jaw-dropping visuals offered by modern *Gran Turismo* and *Forza* incarnations haven't quite been matched by a single PC title, but *Project Cars* aims to change that.

This is a game that strives to be as real as it can, both dynamically and visually. It doesn't matter which of the 60-plus cars you choose – take any of them for a spin at dusk with sun flares enabled and post-processing effects on full and *Project Cars* looks absolutely sublime.

Take your pick

Glance at the back end of one of the game's classic F1 cars and everything's there from individually modelled suspension wishbones to separate spark plug leads. There's also realistic crash

damage, with deformable and detachable body parts, plus the ability to scratch that pristine paintwork and crack windows. It's all stunning stuff, though such a high polygon count and extensive shader use does put your GPU through its paces, especially when you're in a pack of other cars or driving in the rain, where the frame rate drops.

Although the car list is nothing compared to *Gran Turismo* or *Forza*, it still features plenty of metal listed on the *Top Gear* lap times board. Gasp at track day weapons like the Ariel Atom V8, BAC

Mono and Caterham Superlight R500, through to hypercar exotica such as the McLaren P1, Pagani Huayra and W Motors Lykan Hypersport. Lykan what? It's the car of choice for moving between skyscrapers in Abu Dhabi if you're Vin Diesel and have a thing against lifts.

The classic car scene is well catered for with retro BMW M3 and Mercedes 190E German touring cars, plus their spoiler and skirt-clad Ford Capri and BMW 320 Turbo predecessors, which do more to make the eighties look cool than KITT ever could. If open-wheel racing is your thing, you can try your hand at superkarts, 4-cylinder and V8 formula cars, or even classic Formula 1 rides like the 1960's Lotus 49. There are no current F1 machines, however, and you won't find anything with a Ferrari or Lamborghini badge on it either.

Track selection is almost uncompromising though. Think of pretty much any bucket list race track and it'll



With a rear end like this, who needs Kim Kardashian?



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Project Cars is let down by the handling at times

probably be here.

Anyone who honed their virtual racing skills with the early *Toca* games will appreciate the inclusion of UK locations like Brands Hatch, Donington and Oulton Park, while stateside circuits are well represented with Laguna Seca, Road America and Willow Springs. But it's the truly iconic tracks that steal the show. Bathurst, Le Mans, Spa-Francorchamps, Imola, Monza and that motoring mecca, the Nürburgring Nordschleife.

What's more, all the cars and tracks are drivable right from the get-go in Quick Race and Free Practice modes: no unlocking necessary. It's the same story in the slick online multiplayer mode, and there are community competitions to compete for fastest lap times and prizes.

Those familiar with recent *Grid* titles will be at home in Career mode, where you choose between disciplines including open wheel or touring cars and progress through the ranks to reach an

ultimate racing series. There are some clichéd frills along the way, like contract signing, cheesy emails and faux fan tweets, but thankfully no contrived cutscenes to endure. Plus, even if you're channelling the Stig, you can always dial down the AI skill and enable driving assists once you have a reality check and wish you'd stuck to *Mario Kart*.

Up a gear

Yes, *Project Cars* is tough. It has to be to win over the sim racing crowd. These are car geeks who demand authentic handling characteristics and who consequently look down on the *Need for Speed* series with more contempt than Clarkson has for cold dinners. Trouble is, though it comes close, *Project Cars* isn't quite the last word in dynamic authenticity.

Despite its bewildering array of vehicle setups and force feedback options, the cars simply don't handle as realistically or consistently as

in other simulators, such as in *Assetto Corsa* or *Simraceway*. Take a Pagani Zonda R round the Imola circuit in *Assetto Corsa* and its prestigious power will snap the tail out almost as quickly as the tyres lock up if you stamp on the brakes. Select the same car/track combo in *Project Cars* and it gives you the impression ABS and traction control are enabled, even when they're not. It's a similar story with the *Project Cars* and *Simraceway* emulations of the Lotus 72 Formula 1 car, though this time it's Slightly Mad Studios' recreation that's much more of a handful, swapping ends under power with no warning in up to third gear. Few know how the real deal performs, but it's hard to imagine Emerson Fittipaldi tolerating such unpredictable handling back in the day.

If there's one constant in the physics department, it's that you don't feel quite as connected to the driving experience as you might want. This is partly down to those

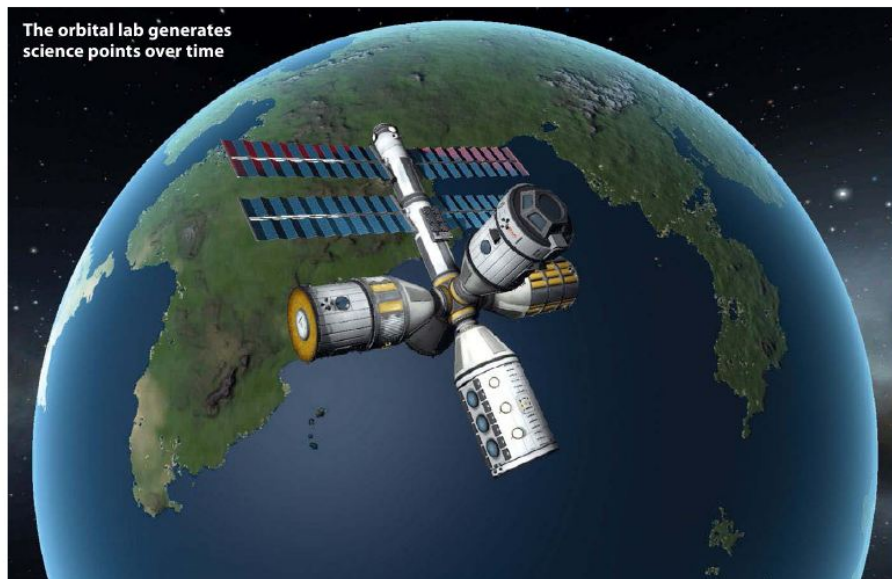
iffy handling characteristics, but also the lacklustre force feedback, which often fails to communicate basics like driving over a kerb and generally leaves many cars feeling somewhat numb.

But these are relatively minor gripes only worth picking on because *Project Cars* sticks its neck out and professes to be "the most authentic racing game on the planet". While it falls marginally short, this is still one of the most polished examples of the genre for PC gamers and strikes a compelling balance between style and substance. ■

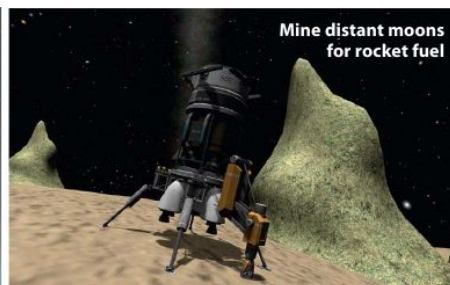
A brilliant racing sim that's occasionally let down by dodgy handling.

 **Windows**
Help & Advice
Verdict

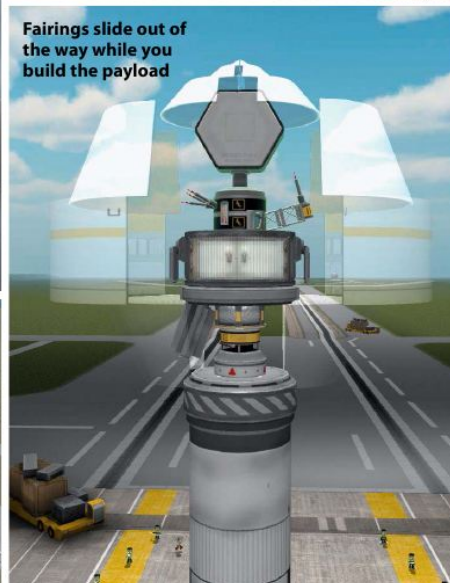




The orbital lab generates science points over time



Mine distant moons for rocket fuel



Fairings slide out of the way while you build the payload



Female kerbals have now earned their place on the crew



Space shuttles are as hard to build as ever

Kerbal Space Program 1.0

The little green astronauts achieve escape velocity


Price £30 | \$47

Developer Squad

Publisher Squad

DRM Steam **Web** kerbalspaceprogram.com

Recommended specs 2GHz dual-core CPU; 4GB RAM; 512MB graphics card, shader model 3.0

 After four years in open beta, Kerbal Space Program is here. You drag and drop engines and fuel tanks to build a rocket, you strap strange little green people into the cockpit and you fire them into orbit.

The aerodynamic simulation has been improved from the beta version, to match the orbital physics. Not only is the air thinner close to the ground now, the density varies with temperature as well as altitude. Drag and lift properly account for how streamlined your rocket is and the sound barrier feels like a real barrier you have to punch through. Fly too fast, too low, and you'll experience compression heating. To protect your

payloads from this buffeting, cargo bays and fairings have been added to the stock game. Fairings can be built to any shape in the editor and have a 'exploded view' feature that moves them out of the way so that you can continue to tweak the payload within.

What's new?

Mining is a new feature with deposits of ore generated for each planet. To harvest it, you must use scanning antennas, placing your scanner in the correct polar orbit. It then unlocks the resource map for that planet.

For all the new parts and improved systems though, *KSP 1.0* doesn't quite feel finished. You can still pull up the debug

menu and tweak the 'drag cube multiplier' or the 'heat convection factor' – it's as if developer Squad still hasn't made up its mind about the best values. Orbital manoeuvres, particularly interplanetary transfers, are still fiddly to set up and adjust. There's nothing to tell you the thrust-to-weight ratio of your ship or its delta-V, neither when you are building your rocket, nor when you are in flight. These numbers are critical to success or failure in space, but the game leaves you to eyeball them or break out the calculator.

The space centre building upgrades feel like they're just removing arbitrary restrictions. The tech tree gives you more

parts as you unlock new nodes, but they aren't necessarily more advanced parts. You start with the smallest fuel tank, for example, and unlock larger ones, rather than beginning with a heavy primitive tank in several sizes and unlocking lighter, stronger ones.

KSP gives you a box of tools and a world of challenges and leaves you in charge of the rest. In fact, trying to 'beat' the game is the least satisfying way to play. Everything new in 1.0 is an improvement.

This is not the last update, it's just the latest one. If you've already paid for one of the beta versions, you can download the release version for free and, if you haven't, it will be the best £30 you've ever spent on a game. ■

A solid, if thin puzzle game, with not quite as much to say as it thinks it has.

Windows
Help & Advice
Verdict



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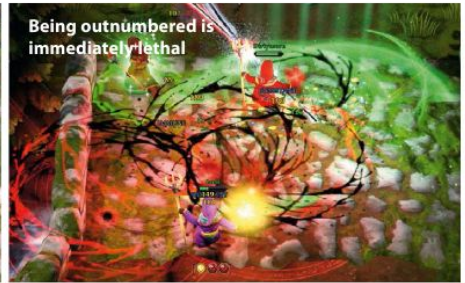
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Magicka: Wizard Wars

Great magic battling wrapped in thoughtless mode design

Price Free
Developer Paradox
Publisher Paradox Interactive
Multiplayer Up to 8 players **DRM** Steam **Web** www.wizardwars.com
Reviewed on Windows 8, Core i5, 8GB RAM, GTX 970

 One of us is going to explode, eventually. Locked in one-on-one combat, our foe shoots a blast of arcane energy at us; we counter with a shield, bouncing his beam back at him. He's stunned, so we take advantage by hosing him down with a water jet, then zapping him with lightning. He throws up a shield of his own, we don stone armour and rush him. He then shoots us in the chest with a flame. The duel is over; it's a tie.

Rarely have we had as much fun with a game as we have with duel mode in *Magicka: Wizard Wars*. It takes *Magicka's* chaotic multiplayer arena modes, slims them down, and shoves them into a free-to-play, unlockable-upgrade framework that

borrows heavily from online staples such as *Dota 2* and *World of Tanks*. A wizard controls eight elements, each tied to a keyboard key. By typing any combination of three and casting them on yourself or others, thousands of possible spells are born. *Magicka* allowed combinations of up to five elements, but *Wizard Wars* has been trimmed to only three.

Cool combat

Combat comes in three modes. The first is a familiar take on a three-lane MOBA, with mobs to farm and enemy bases to destroy. We enjoyed pushing lanes and smacking mobs, but found long walks from base back to the action and underpowered mobs a bit boring. Engaging other players

was more fun, but the structure of the match – first team to kill 200 mobs drops the enemy defences – discourages PvP because it's time spent not farming.

The second and more fun mode is team deathmatch, based on capturing spawn points. Each team has a set number of respawns and scrambles for control over territory. In both modes, teammates were my single biggest complaint. Very few games finished with all eight players connected, and an early quitter guarantees a slow, painful loss for their team. Because of the small team sizes, *Magicka* is best played with reliable friends.

Finally, there's duel mode, which is as close to perfection as it is possible to be. Two

wizards, one small arena, zero nonsense. Duel mode put the focus entirely on *Magicka's* excellent magic system.

Everything from robes to daggers to heart-patterned boxer shorts is upgradable via experience points and real-world cash. Paying for gear could create a pay-to-win situation, but even the best gear comes with self-balancing handicaps. A robe that gives bonus to earth makes lightning weaker; a ring with boost to fire makes arcane weaker. On balance, there was basically no difference to overall power no matter what we wore.

The refined magic casting is fun, and makes us hopeful for *Magicka 2*. But as good as duel mode is, one truly great game mode out of only three didn't keep me around. ■

Worth a try, but *Wizard Wars'* combat system is restrained by multiplayer mode design.

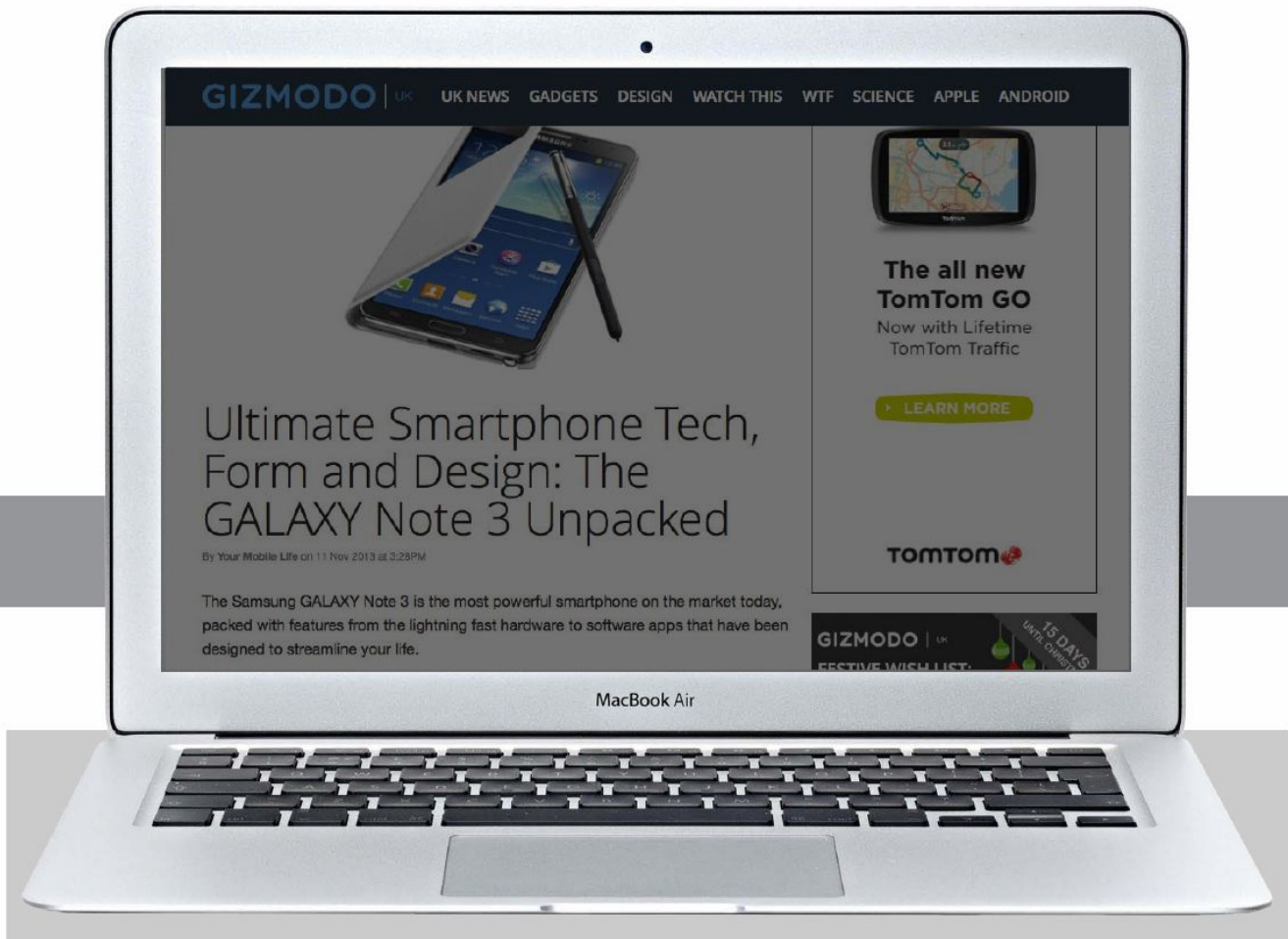
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