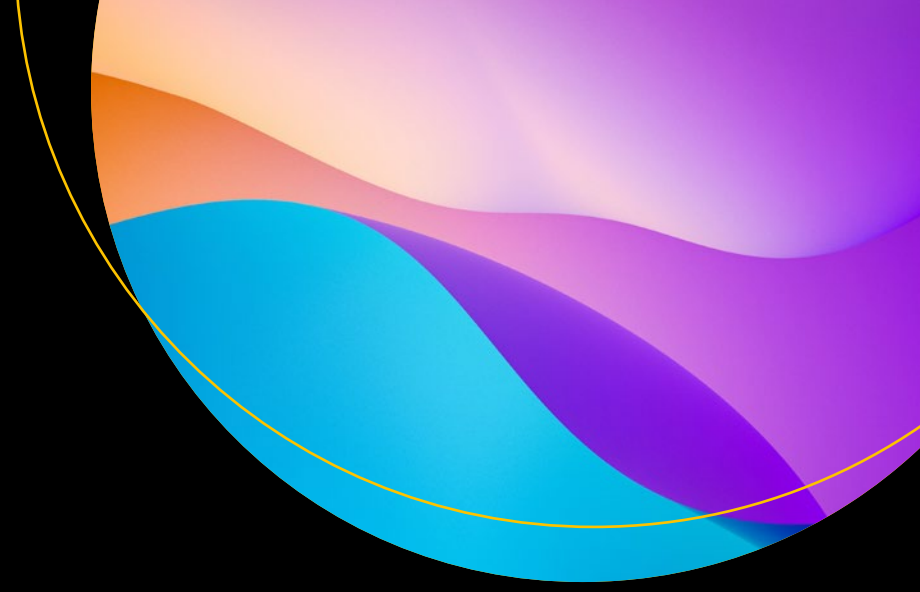

Troubleshooting and Supporting Windows 11

Creating Robust, Reliable, Sustainable, and Secure Systems

Mike Halsey, MVP

Apress®

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For Jake and Rory Webster, who took care of everything else for me this summer, so I could take care of writing this book.

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About the Author

Mike Halsey is the author of more than 20 books and is a recognized technical expert. He has been a Microsoft Most Valuable Professional (MVP) awardee since 2011. He is the author of *The Green IT Guide* and *Windows 10 Troubleshooting, Second Edition* (Apress, 2021).

He understands that some subjects can be intimidating, so he approaches each subject area in straightforward and easy-to-understand ways.

Mike is originally from the UK, but now lives in the south of France with his rescue border collies, Evan and Robbie. You can contact Mike on Twitter at **@MikeHalsey** and find more hints, tips, and support at his website: **www.Windows.do**.

Introduction

If you're looking for a career in IT administration or support, or have already been working in IT for some time, you will know that the world you work in has changed considerably. The pandemic of 2020 rewrote the guidebook for supporting end users and maintaining computers, and what was the exception just a few short years ago, of people working from home and from coffee shops at all manner of strange hours, has now become the norm.

I've been writing Windows troubleshooting books since Windows 7 launched, but knew that this new approach to work would require a new approach to training and to the books that I write. For this book then, I took a completely different approach, keeping subjects tight and concise and making sure that remote support and the new challenges it presents are covered.

For everything else, if I don't reference it directly, then you will find links to further information within this book to help you get the information you need. I've put all my years of experience as an author and an IT professional into making sure that you get the information you need quickly, because supporting end users quickly and maintaining high productivity is the order of the day.

I sincerely hope you enjoy this book too, not as a dry technical guide but as a fun read with anecdotes, stories, and fun snippets, and everything you need to keep you entertained as you learn new and updated skills.

PART I

Troubleshooting Fundamentals

CHAPTER 1

Introducing Troubleshooting in Windows 11

We're living in interesting times when it comes to working in IT and providing support for end users in the business space. Having now emerged from the global pandemic of 2020 (if only there was a phrase we could have used to describe seeing it coming), many if not most companies and organizations have workforces that, to a certain extent anyway, have rather enjoyed working from home.

It certainly hasn't been without its challenges. Many were holed up throughout repeated lockdowns in small apartments, many without even a small balcony to step out onto. Many more had children at home all day, every day, becoming more and more frustrated with being unable to see their friends, and with home workers also having to double as unqualified and unprepared teachers, using whatever resources they could lay their hands on.

Despite all of this, people found great value in working from home. Days were longer for people, and more could be done without the time spent, from half an hour to sometimes six hours a day travelling to and from the workplace. Not having to spend vast sums of money, sometimes thousands of dollars, on fuel or public transport also brought its own benefits.

When you have more time to spend with your family, or on your hobbies and interests, the reasons to return entirely to the way life was before can begin to appear unreasonable. It's no coincidence that during the lockdown periods Microsoft saw huge spikes in the numbers of people playing games on Xbox.

M. Halsey, *Troubleshooting and Supporting Windows 11*, https://doi.org/10.1007/978-1-4842-8728-6_1

So when 2022 came around and I began writing this book, many companies were finding themselves having to tactfully and diplomatically negotiate with their employees. Apple is a good example of this. Having just spent around five billion dollars on their new California headquarters, some employees threatened legal action if the company forced them to return to the office full time, no matter how nice the new premises were. Other companies such as Google sought to cut costs by withdrawing some employee benefits such as on-site laundry and dry cleaning and tried to make it more difficult for employees to claim free evening meals.

None of that acted as an incentive to return to the office full time. It may happen eventually, but there will forever be an aspect of hybrid work that you will be supporting.

Then there's the cloud aspect of the change. In 2021, Microsoft released its Cloud PC offering as part of the Microsoft 365 Enterprise suite of services. Initially expensive, we can fully expect prices to drop, and no doubt for the feature to make its way to consumer subscriptions in the fullness of time.

Cloud PC enables people to run a full streamed Windows 11 desktop to any device they own, from a PC to an iPad and a Chromebook. With Microsoft's push under CEO Satya Nadella to transition to a services company and support every operating system platform out there, you can access business services from any device again, and you'll no doubt find yourself supporting end users, working from home, on their Google Chromebook from time to time.

How Windows 11 Came About

There's still good reason to support and troubleshoot Windows 11 desktop PCs and laptops though, and a large part of this is the story of how Windows 11 came about in the first place. There had long been a story that Microsoft had publicly stated Windows 10 was to be the last version of Windows. This story is actually apocryphal, and the company never made a formal statement to that effect.

It was actually a Microsoft senior technical evangelist, a guy called Jerry Nixon, who at the Microsoft Ignite conference in 2015 said, "Right now we're releasing Windows 10, and because Windows 10 is the last version of Windows, we're all still working on Windows 10."

It could be that this *was* an official Microsoft policy at the time, because it tallies with something I was told the same year by a senior Microsoft marketing official at the 2015 Microsoft MVP (Most Valuable Professional) Summit. He was talking about the naming for Windows 10, being a little odd coming as it came after Windows 8.1 (some Microsoft staffers joked the point was actually a tiny plus [+] sign).

He told the assembled MVPs in the room that there were two reasons for the Windows 10 name. Firstly, Microsoft had taken the name Windows 9 to focus groups (and Microsoft love using focus groups) who fed back that 9 didn't make it sound like the big release that it was.

Then came the interesting bit, Microsoft had planned to just call it "Windows" and be done with it. Windows 7 was out of support and nobody was using Windows 8, so why the hell not? This is when, he said, the lawyers had got involved. Twice in recent years, they'd been sued over a name: first by Rupert Murdoch's Sky Television network in the UK over the name "SkyDrive" and then by a German cash-and-carry company over the use of the word "Metro" to describe their design language for Windows 10.

In both instances, the names had to be changed; SkyDrive became OneDrive (which is a better name anyway if you want my opinion), and Metro became Fluent. The lawyers pointed out that if a double-glazing company in Finland (to give one random example) sued over possible confusion caused by the name "Windows," then Microsoft would be completely unable to change the name.

The plan then became, so he told us, to call it "Windows 10," and then when Windows 8.1 was falling out of support and Windows 10 was the only version of Windows in use, to just start calling it "Windows." Because it would still officially be called "Windows 10," that ought to be enough to placate the lawyers if anybody were to sue over the name (I know, it's ridiculous when you think about it, but this apparently is what lawyers go to bed thinking about at night).

Then came Windows 10X. Microsoft's Surface hardware group were planning to release two new dual-screen devices that they announced in late 2019. In the end, only one of the devices came to market, the Surface Duo, and by the time it had, the OS choice had changed to Google's Android.

Windows 10X was supposed to be the next huge leap in Windows architecture and very likely would have made this book entirely unnecessary overnight had it succeeded.

When Windows 10 was being developed, Microsoft had changed the underlying architecture so that they could componentize the OS. There would be "Windows 10 Core" which included the kernel files, and then all other aspects of the OS from the desktop interface to server features could be plugged in as needed.

The overall effect was that Microsoft could produce many different "flavors" of Windows 10, from Windows 10 IoT (Internet of Things) to Windows 10 Server, Windows 10 Azure Server, Windows 10 standard (the Home, Pro, and Enterprise editions), and so on.

This componentization work continued with Windows 10X which was to take it to the next stage. For some years, Microsoft had supported completely virtualized apps and software in Windows. Microsoft Virtual Desktop Infrastructure (VDI), which later transitioned into Windows Azure Virtual Desktop and then to Windows 365 Cloud PC, has been around for some years and allows anything from an individual app to an entire desktop to be run on a client machine in a virtualized environment.

The trick with all this is that the end user would never know the difference between a virtualized and streamed app and a locally installed one, as they would both be launched from the Start Menu or Taskbar and operate identically. You might remember "Windows XP Mode" for Windows 7 that operated in exactly the same way, and this is also the same way that the Xbox game console works, with one VM for the Xbox shell and another for games.

The upshot of Windows 10X would be that everything from the desktop to installed apps and software would be containerized and run its own, distinct virtual machine (VM). Even the currently running Windows kernel would have apparently run in a VM, meaning the actual kernel could be updated and upgraded "on the fly" without the need to reboot the PC.

This would have transformed Windows forever. Completely banished would have been instabilities and incompatibilities caused by the need to support legacy software dating all the way back to DOS and Windows 95. Any app, service, or driver that crashed wouldn't be able to take the entire operating system or other apps and services with it. The Blue Screen of Death (BSOD) would have been relegated to the dustbin of history, and yours truly would have been put well and truly out of a job.

The problem came with performance, and Microsoft eventually scrapped Windows 10X, admitting they couldn't get it to work reliably and with decent enough performance to release it. This is a shame as (and especially as I'm heading into early retirement anyway) I truly hope they find a way to make this work as hardware performance improves over time, perhaps releasing this as Windows 12 around 2024.

Microsoft had talked extensively about Windows 10X, however, and shown many demos and screenshots of the new interface they had designed for it. This new interface garnered many positive reviews and plaudits, so when PC Makers, also

called Original Equipment Manufacturers (OEMs), came to Microsoft during 2021 bemoaning a slump in PC sales and asked if Microsoft could release something new and shiny to reinvigorate the market for them, the decision was made to fold the new componentized interface into Windows 10 and create a new OS called Windows 11.

How Windows 11 Differs from Windows 10

It's this componentization that means that underneath, Windows 10 and Windows 11 are the same core OS. They share the same kernel with each other and with Windows Server. This componentization was done primarily for reasons of cost, making it much cheaper to support one Windows core, rather than several different ones, and as the kernel was separate from all the other plug-in components, support and maintenance for them would also become cheaper.

There are some distinct differences between Windows 10 and Windows 11 though that go deeper than a slick new interface (and the interface is a subject I'll come back to later on). These changes though are mostly focused on which PCs Microsoft deemed suitable for Windows 11 to be installed on, and they were controversial indeed.

The most controversial decision was to enforce the need for a Trusted Platform Module (TPM) 2.0 chip or support for a Firmware Trusted Platform Module (fTPM) in the UEFI firmware. Microsoft wanted to make Windows 11 much more secure than previous versions and also encourage people to use biometric security more, such as their Windows Hello features, in their drive to banish the need for passwords.

TPM chips had been mandatory for new Windows PCs since the release of Windows 8+1 (sorry, Windows 8.1) in 2013. This only applied to new PCs sold through OEMs however. It didn't apply to PCs that gamers, pro users, and enthusiasts built for themselves, nor did it apply to new motherboards that were sold individually, though a few did come with a socket for a TPM chip anyway.

It also didn't apply to all the older Windows 7 desktop and laptop PCs that businesses and organizations around the world upgraded to Windows 10 or purchased new for Windows 10 from manufacturers that agreed to produce older-specified machines so as to maintain full compatibility with an organization's software and hardware peripherals.

fTPMs though were still in the planning stage in 2015 when Windows 10 was released and weren't widely available until shortly before the release of Windows 11.

So while many businesses and organizations and even consumers had Windows 8.1 era PCs that included a TPM, this was often a TPM 1.0 chip, and Microsoft deemed this lacked important security they were requiring for Windows 11 because boot keys could be intercepted and hacked as they were transmitted unencrypted between the chip and the boot loader.

The theory, Microsoft thought, was that any PC with a TPM 1.0 chip would be very old by the time Windows 11 was released (TPM 1.0 became available in 2011, with TPM 2.0 replacing it in 2014, the year before Windows 10's release), and everybody from consumers to corporations would be purchasing new PCs anyway.

Sadly, what Microsoft failed to factor in was the overall reliability of modern computers. Back in the days of Windows 95, computer hardware could be flaky and often expire after just three to five years, forcing people to upgrade.

Only yesterday though as I write this, a friend who works in IT and one of his colleagues found an old Dell laptop running Windows XP that booted to the desktop and worked perfectly when they tested it (see Figure 1-1).

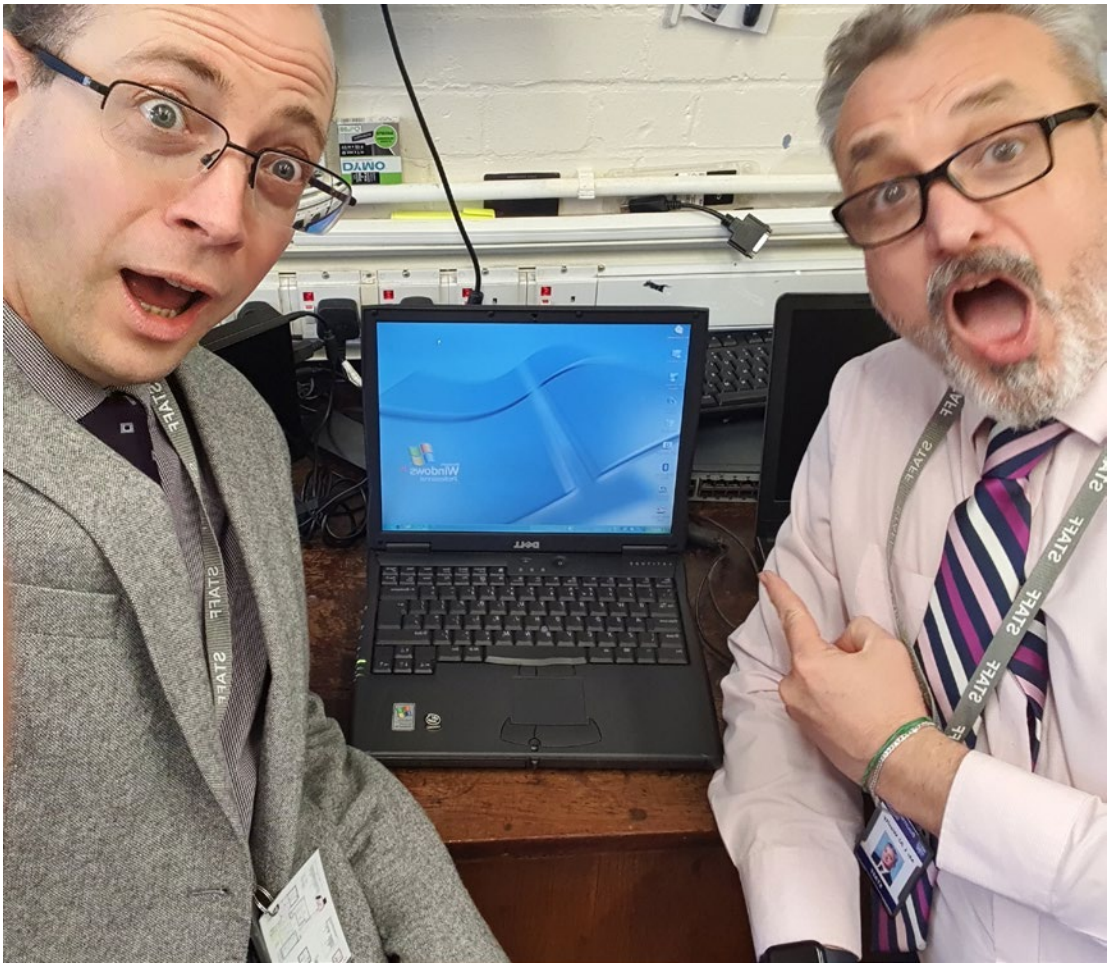

Figure 1-1. *Stephen Coombes and Laith Al-Wasity at Bournemouth School (UK)*

It's therefore possible for a modern desktop or laptop PC to work for 15 years or perhaps even longer. I've recently upgraded my older Surface Laptop 2, which I purchased in 2018 (so four years old by this point) with a Surface Laptop Studio. Not wanting a perfectly good laptop to go to landfill, I offered it to another friend who had previously had my cast-off Dell XPS 13 laptop (circa 2015 and now seven years old), but he told me the XPS was still perfectly good, that he really liked it, and that he felt no need to upgrade.

A few months before writing this, I wrote *The Green IT Guide* (Apress, 2022) in which I talk a lot about the problems of ewaste. Some 50 million tons of ewaste are created globally each year, but as I write this, only around 20% of it is recycled, with the rest of it going into landfill.

The problem with modern electronics is that they contain many metals and minerals that can heavily pollute the environment; pose health risks to people, animals, and plant life; and even be carcinogenic. In India, where ewaste recycling is in its infancy, experts say that some 80% of the country's surface water is polluted. I won't go on about this here, I would rather encourage you to purchase the book, but it's a huge problem that's not going away any time soon.

The other controversial change was that Windows 11 would require an eighth-generation Intel processor (and equivalent generation AMD processors). This was primarily for reasons of security, with the seventh-generation Intel chips being hit by some serious malware when flaws were discovered in 2017.

These seventh-generation chips though were sold with PCs and laptops between 2016 and 2020 (the eighth-gen chips being sold from 2017 through to 2021), meaning that many Windows 10 PCs would be ineligible to run Windows 11 despite being only two or three years old themselves.

With Windows 10 ending support on October 14, 2025, though we can likely expect paid-for extended support as happened with Windows 7, this means these PCs could be as little as five or six years old when Microsoft makes them completely obsolete and insecure. From an environmental standpoint, this is intolerable, though Microsoft made a very good case for security overall.

These changes and the new interface aside, that's pretty much it for the differences between Windows 11 and Windows 10. The old Administrative Tools have been renamed Windows Tools (we'll look at this in Chapter 2) which will be important for you as an IT Pro and troubleshooter, the Windows 11 Start Menu no longer supports Live Tiles (we won't miss them), and Windows 10 can't run Android apps from the Amazon Appstore, but that's about all.

How Windows 11 Will Change During Its Life

What is of importance though is how Windows 11 itself will change over the coming years until we get that completely virtualized Windows 12 I'm still holding out hope for around 2026 or so.

Take a look at Figure 1-2, and you'll see the Settings panel as it appeared in Windows 10 when it was launched in 2015 and how it looked at the end of 2021 around the time of the launch of Windows 11.

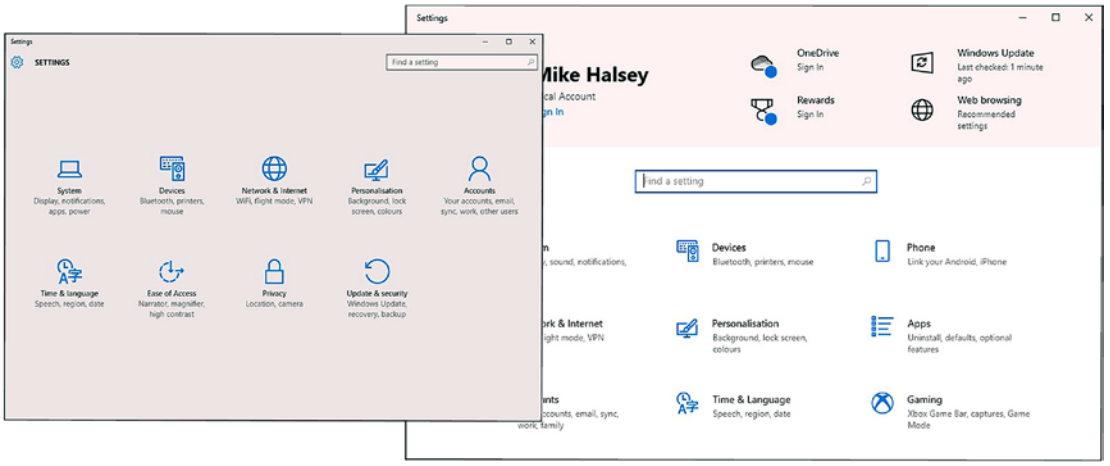

Figure 1-2. *Windows 10 changed considerably during its life*

This was just one aspect of the operating system that changed. When Microsoft first introduced Settings in Windows 8, it was a very basic affair and didn't even offer all the desktop personalization options of the OS. Microsoft has been on a mission though to remove the venerable Control Panel and replace it with a much more modern, and more suitable for a modern OS, Settings interface.

There are many reasons for this, and part of it is making the main interface for Windows look and operate much more like that found in Apple's Mac OS operating system or on an iPad or Android smartphone, or even a Google Chromebook, all of which are leagues ahead of Windows for the simplicity of their settings.

This isn't a bad thing, but it's slow going. The primary reason for this is that there are legacy components in Windows that are still required by some businesses and organizations that date back to Windows 3.1. In Figure 1-3, you can indeed see that you don't have to dig very hard in Windows 11 to find interface elements that date back to the early 1990s.