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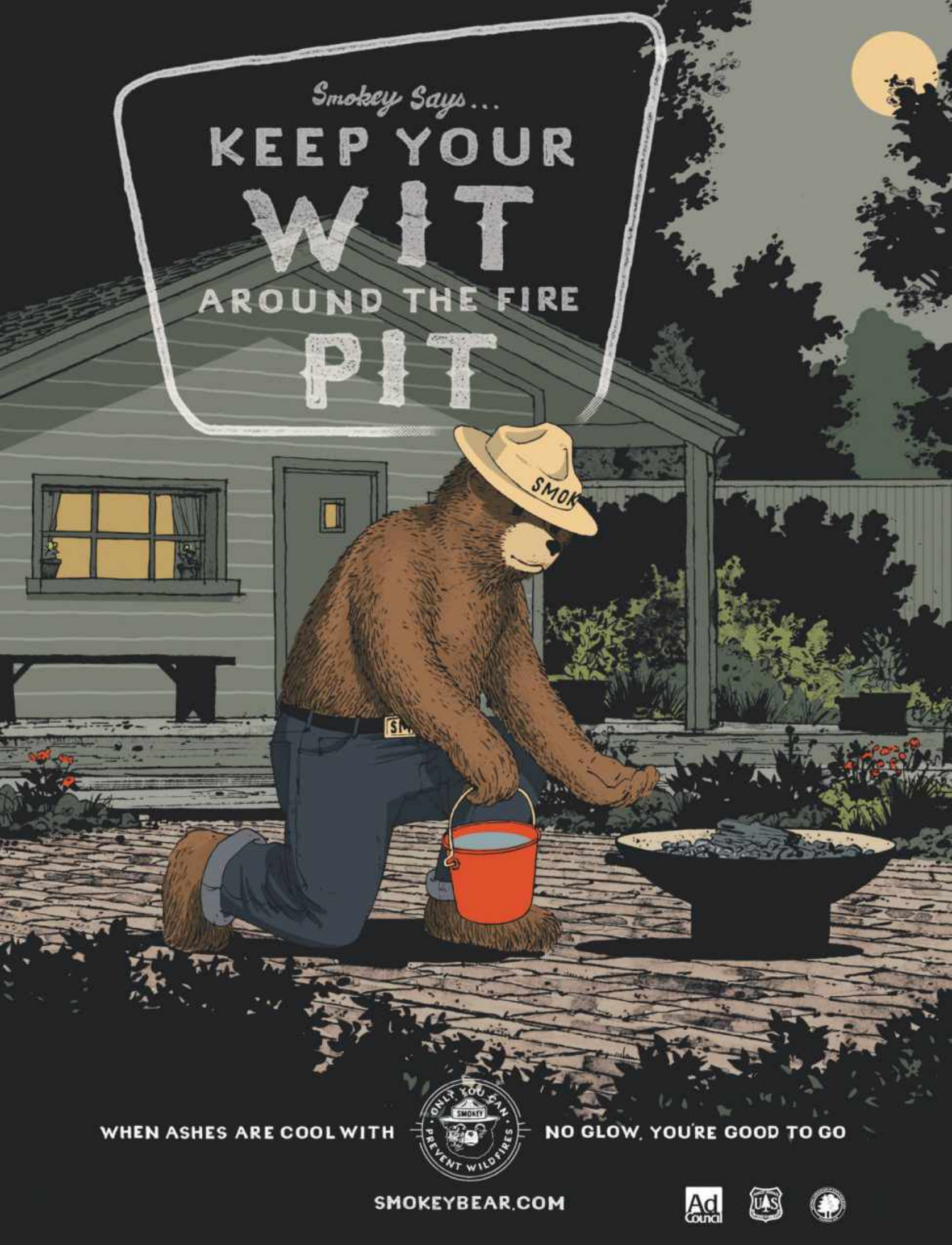
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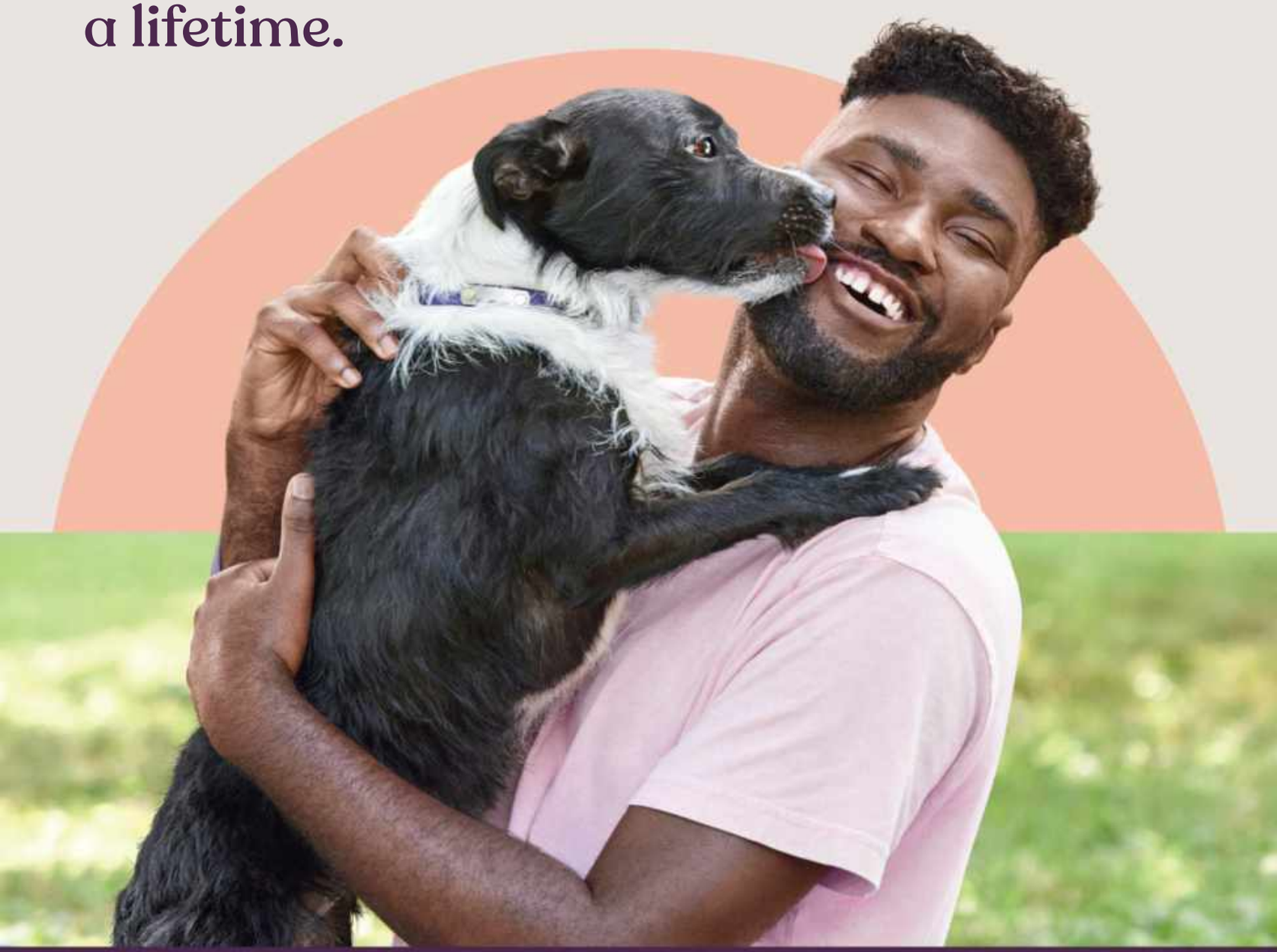
Help a lost pet get home

Posting a lost pet notice can reunite a family for a lifetime.



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Google Search is getting a radical AI-powered overhaul

Google's search engine is going to get the most monumental change it's had in decades.

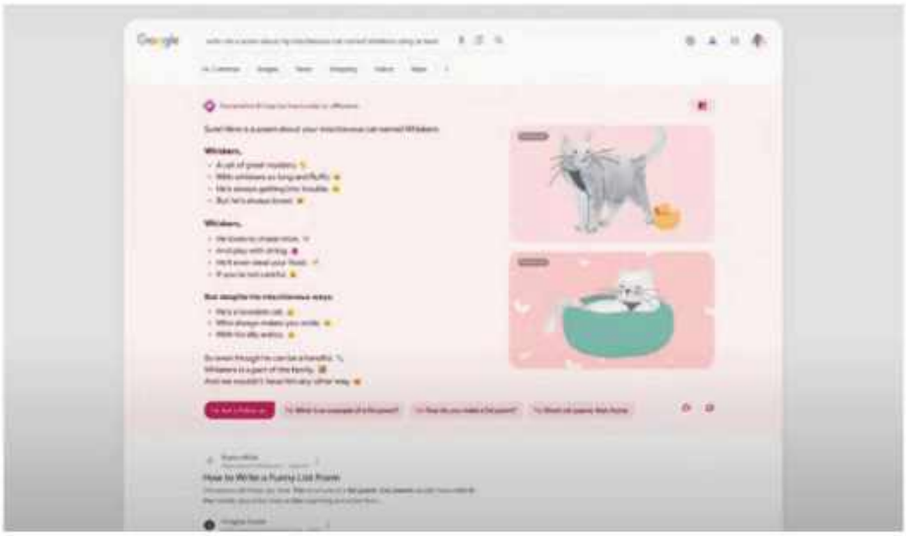
BY MARK HACHMAN

Google's search engine has remained relatively unchanged for decades. With the advent of AI, look for that to change—and you can test the new-look Search today.

Google Search's familiar interface, with a search box and a list of responses, is being overhauled to look more like Microsoft Bing's chatbot (fave.co/3Oa83dp) now does, with AI stepping in to provide supplementary information it never offered before. (In Bing, you can perform a "traditional" search, with a list of links and a Bing Chat box to the side; you can also conduct the search entirely within the Bing Chat interface by selecting Chat from a list of options, or scrolling or swiping up on the Bing Search page.)

Google is trying something a bit different with its updated search engine, bringing in recommendations as well as facts. Searching

IMAGE: MOSTAFA-MERAJI / UNSPLASH



Bulleted lists and integrated images are something most AI chatbots can't handle. Google Search can.

for a "good bike for a 5-mile route with hills," will interpret that result with bikes with a good suspension and tires, built on Google's Shopping graph.

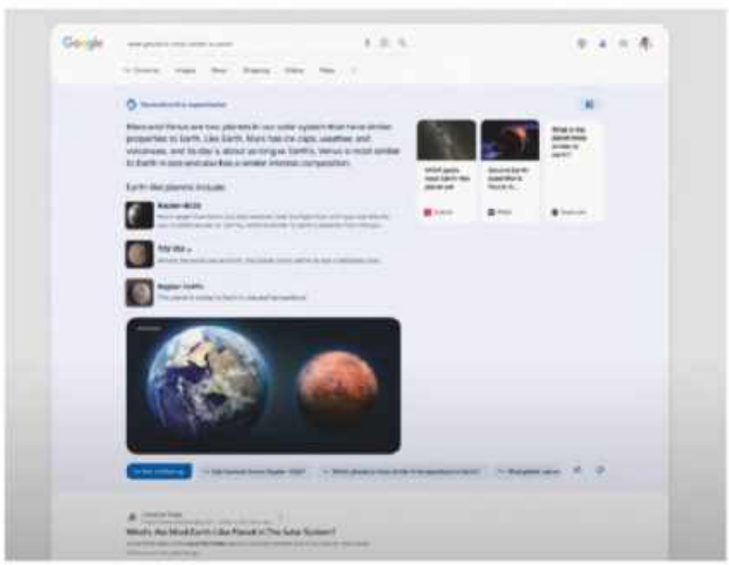
Want a follow-up? Google will offer a conversational mode as well, with follow-up queries and other search results. Supplementary results in a sidebar can show you which merchants have the bike in stock and what their policies are.

The search function will appear on mobile and in a conversational interface, too, knowing previous queries.

Google also showed off a quick snapshot of the future such as bulleted responses, more images, integrated videos, and sophisticated queries that included comparisons and deep knowledge, including restaurant menus.

Google said that it's using an updated PaLM 2 model (fave.co/3W9acYF) as its foundation, driving both Google Search as well as its Bard chatbot. The demonstration also revealed a more subtle change: Google Search looks like it will be a front door to Bard, so that a "search" will now appear more like a conversation.

Want to try it out? You can tap the labs icon (the small flask icon) in either the latest version of the Google app or the Chrome desktop. That will put you on the waitlist, where you'll be able to play with it at a later date. How long will that be? Well, since Bard is now open to the public (goodbye, waitlist!), hopefully not long.



Another look at Google Search.

Windows 10 won't receive any more feature updates

Microsoft makes it official: Windows 10 22H2 will be the last update for Windows 10.

BY MARK HACHMAN

Windows 10 might not be dead, but it's nearing the end of the road.

Microsoft said Thursday that the company doesn't plan on releasing any additional feature updates to Windows 10. "The current version, 22H2, will be the final version of Windows 10, and all editions will remain in support with monthly security update releases through that date," Microsoft's Jason Leznek said in a blog post (fave.co/3MfCAEa) describing the latest Windows client roadmap update.

Microsoft has also updated the lifecycle page (fave.co/3Bs1iMv) for Windows 10 Home and Pro to reflect the changes.

"Windows 10 will reach end of support on October 14, 2025," the page reads. "The current version, 22H2, will be the final version of Windows 10, and all editions will remain in

IMAGE: FRIEMANN/SHUTTERSTOCK

The current version of Windows 10, version 22H2, will be the last feature release for the operating system.

support with monthly security update releases through that date. Existing [business] releases will continue to receive updates beyond that date based on their specific lifecycles."

Microsoft hasn't made any changes to the end-of-life support date for Windows 10; October of 2025 has been the target date to end support for Windows 10 (fave.co/453aILS), and has been for years (fave.co/3MvERML). What's new is simply confirming what many suspected: that this current version of Windows 10, version 22H2, would be the last feature release for Windows 10. The latest feature release wasn't really even a feature release, just mainly bug fixes.

Meanwhile, Microsoft's Windows 11 2022 Update (previously code-named Windows 11 2H22) is a collection of new features that address many things many people *don't* use regularly, including accessibility features, as our Windows 11 2022 Update (22H2) review (fave.co/3Mu22p3) concludes. Windows 10 is an excellent OS (fave.co/3rARUlb), however, which has made it difficult to recommend a move—we've been able to think of three reasons to upgrade to Windows 11 (fave.co/3pJtKqw), but others have made it difficult to transition.

What we do know now, however, is that Windows 11 is the future. Well, yes, we knew that already, but Microsoft is making it official. Sorry, Windows 10 fans. Your time with the system is nearing an end.

Microsoft says Windows 11 is the future of its OS.

Gmail can warn you if your account is being trafficked on the dark web

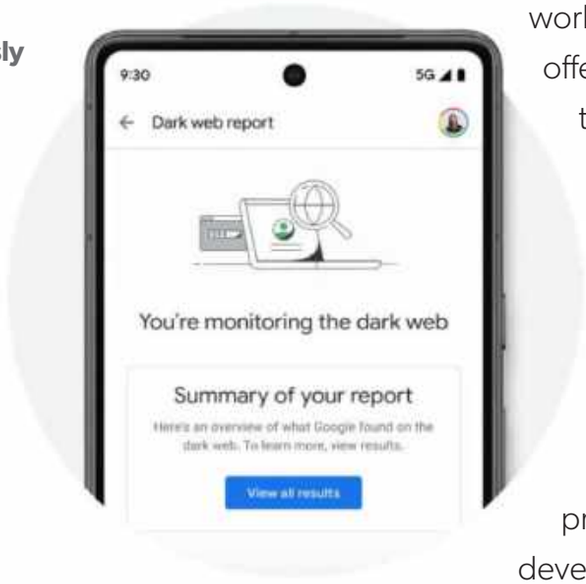
The service rolls out to all Gmail users in a few weeks. **BY MARK HACHMAN**

Set a reminder: In just a few weeks, you'll be able to ask Google if your email address is being used as currency on what's known as the "dark web."

It's a service that the company previously made available to Google One subscribers as a paid security method. Now, it's being rolled out to Gmail users as a whole.

The "dark web" is usually referred to as a series of servers that don't publicly register with search engines—quite the opposite, as they want to stay hidden from the eyes of the law for whatever reason. The dark web or Darknet (fave.co/4561wGI) surfaced a few years ago, when researchers started delving into the far reaches of the web. There are plenty of vital, positive aspects of the dark

IMAGE: FIZKES/SHUTTERSTOCK



The service was previously available to Google One subscribers only.

web; it can be used to freely express yourself in repressive regimes, for example. But illegal commerce can be carried out there as well: drugs, weapon sales, and worse. Hackers and criminals also buy and sell personal information stolen in security breaches, which is where Google's privacy feature comes in.

Google maintains its own eyes on the dark web to try to protect its users. It's not perfect, but if Google detects that your email address (which could be used as your login information on sites you've signed up for) has been detected, it's a good sign that your email, Google account, or one of your signed-in sites has been compromised. In this case, Google will flag your email and send you a notification.

While we don't know exactly how this will work, we imagine that it will work similarly to the privacy checkups offered by Google and Microsoft, where the services will periodically ask you to review your personal information, including any passwords that have been compromised in privacy breaches. It's just one way to tell whether your password has been stolen (fave.co/3cgALrU).

Google also announced a few other privacy initiatives at Google I/O, its developer conference:

- New spam protections in Google Drive to help determine if files you saved are actually something you don't want.
- Location alerts on your phone if an app wants to share your location.
- A new data deletion option within Google Play.

Google will now warn you if an app wants to share your data.

All those open browser tabs are stressing you out, study says

You can also keep your tabs (and sanity) with a little help from your browser. **BY ALAINA YEE**

Your number of browser tabs may be the source of your stress when working online. Well, part of it, anyway. According to a study performed at Aalto University (fave.co/3Bvwnii) in Finland (and spotted by PC Gamer, fave.co/42I6QOQ), browser clutter appears to be a problem for most people.

But just what is browser clutter? The research, which involved 400 online survey respondents and 16 in-person interviewees, breaks that concept into several components—one of which involves the number of tabs that sparks stress and frustration. Also folded into this concept are advertisements, pop-up notifications, and disorganized information on a page.

The study, however, did not identify a magic number of tabs that helped avoid becoming overwhelmed. Survey participants only identified whether they saw browser clutter as a problem, which most people do.

IMAGE: 2H MEDIA/UNSPLASH

(About 57 percent see it as a mild issue, while almost 25 percent see it as a somewhat or serious concern. The remaining 18 percent aren't bothered at all.) Instead, the tipping point for tab usage—or in the words of the study, "tab limit"—is personal, as hinted by the habits of study responders. While the average was 5 to 10 open tabs and 1 to 3 open windows at one time, the full range included one person with less than three open and another with about 400. (I see you, my fellow tab enthusiast.) Basically, when you start to feel annoyed by your open tabs, you've found your tab limit.

The good news is if you have a bunch of tabs open for research—a common reason for tab clutter among the study respondents—you don't have to oscillate between peacefulness and visual overload. We're not scientists here at PCWorld, but we do know a little bit about web browsers. Chrome and Edge users can make use of a built-in tab group feature (fave.co/41EmVUy), which lets you cluster together tabs related to the same topic. When they're not in use, you can collapse the group down so those tabs temporarily disappear from view. Edge also has a Collections feature (fave.co/3o1VC8R) that functions somewhere between tab groups and bookmarks, where your saved links are saved a bit more permanently, yet still segregated for easier reference.

There are fixes for webpage elements that melt your brain in aggregate, too. Reader modes (fave.co/3pMyIma) in Chrome, Edge, and Firefox strip a page down to its basic elements for quicker parsing. As for ads, those can be removed through use of an ad-blocking browser extension (fave.co/42FqATi). (You can support your favorite sites by adding them to the extension's approved list, or otherwise donating or subscribing.) While those who took part in the Aalto University study said that third-party extensions like SessionBuddy became too much, these tricks are built into your browser or only require minimal active maintenance. It's how I manage dozens and dozens (sometimes hundreds) of browser tabs with very little stress.

Tab groups can help with tab clutter (and browser clutter overall).

Back it up: Most hard drives that fail do so within 3 years

Your storage isn't inherently destined to die young, though. **BY ALAINA YEE**

Follow any tech site with regularity and you'll hear the same refrain over and over—*back up your files*. The longer you wait, the more you flirt with disaster, and you don't have as much time as you might think. In March, a Los Angeles storage recovery service revealed that on average, their clients' failed hard drives died within the first three years of use (fave.co/455lVvj). And now a study from Backblaze has corroborated that finding with much more data.

In the original report, Secure Data Recovery came to its discovery by cataloging the details (fave.co/457cwnh) of 2,007 faulty drives from six prominent manufacturers, with capacities ranging from 40GB to 10TB. Backblaze's latest release of drive statistics (which the cloud storage and backup service publishes quarterly about the

IMAGE: CHERRY BLOSSOM/SHUTTERSTOCK

storage powering its data centers) paints a similar picture.

In fact, for the Q1 2023 info drop, the company purposely dug into its own data from the past ten years (fave.co/3o8A2iX), after seeing the Secure Data Recovery info. Turns out that Backblaze's 17,155 failed drives clocked an average age of two and half years—or a little bit less than the average of two years and 10 months in the SDR report. The longest-wearing drives survived for almost five years while the shortest-lived bit the dust in less than a year.

BACKBLAZE AVERAGE AGE OF DRIVE FAILURE BY MODEL

MFG	MODEL	DRIVE SIZE	FAILURE COUNT	AVERAGE YEAR	FAILURE IN MONTH
WDC	WD10EADS	1TB	64	4	8
Seagate	ST31500541AS	1.5TB	397	4	2
Seagate	ST31500341AS	1.5TB	216	4	1
HGST	HDS722020ALA330	2TB	235	4	1
Seagate	ST10000NM0086	10TB	120	3	10
Seagate	ST8000DM002	8TB	808	3	8
HGST	HDS723030ALA640	3TB	73	3	6
Seagate	ST4000DX000	4TB	81	3	6
Seagate	ST8000NM0055	8TB	1,288	3	4
HGST	HDS5C3030ALA630	3TB	150	1.1	3
Seagate	ST4000DM000	4TB	5,249	3	3
HGST	HMS5C4040BLE640	4TB	390	2	7
HGST	HUH721212ALN604	12TB	290	2	7
Seagate	ST6000DX000	6TB	96	2	5
HGST	HMS5C4040ALE640	4TB	217	2	4
Seagate	ST3000DM001	3TB	1,708	2	0
Seagate	ST12000NM0008	12TB	888	1	12
HGST	HDS5C4040ALE630	4TB	89	1	11
Toshiba	MG07ACA14TA	14TB	852	1	9
WDC	WD60EFRX	6TB	72	1	8
Seagate	ST12000NM007	12TB	2,023	1	6
Seagate	ST12000NM001G	12TB	217	1	6
Seagate	ST14000NM001G	14TB	257	1	5
Seagate	ST14000NM0138	14TB	187	1	4
WDC	WD30EFRX	3TB	174	1	2
Seagate	ST1500DL003	1.5TB	90	1	1
HGST	HUH721212ALE604	12TB	128	1	1
WDC	WUH721414ALE614	14TB	53	1	1
Seagate	ST16000NM001G	16TB	211	0	12
Toshiba	MG08ACA16TE	16TB	108	0	9

Sorted by average failure age.

Backblaze also breaks out the dead drives by their model numbers and capacities, providing a deeper glimpse into individual drive reliability—sort of. The company cautions against making assumptions about capacity influencing potential lifespan, especially the data initially suggesting that smaller drives last longer than larger ones. Backblaze's data centers have completely retired lower-capacity storage, while the fate of some bigger models remains to be seen. But in case you were curious, the average age of Backblaze's failed drives no longer in operation is…two years and seven months.

Backblaze just drove a stake into any assumptions that a bigger data pool would soften or

disprove Secure Data Recovery's results. If your drive is going to bite the dust, it'll happen sooner than most people expect—though the *chances* of it happening aren't as high as some people might fear. Backblaze found that of 236,893 drives and 30 different models, they had a 1.4 percent lifetime annualized failure rate (or general rate of failure within any given

BACKBLAZE HARD DRIVES LIFETIME ANNUALIZED FAILURE RATES

MFG	MODEL	DRIVE SIZE	DRIVE COUNT	DRIVE DAYS	DRIVE FAILURES	AFR	CONFIDENCE LOW	INTERVAL HIGH
HGST	HMS5C4040ALE640	4TB	3,722	15,582,325	223	0.52%	0.50%	0.60%
HGST	HMS5C4040BLE640	4TB	12,728	34,617,142	391	0.41%	0.40%	0.50%
HGST	HUH728080ALE600	8TB	1,116	2,071,099	47	0.83%	0.60%	1.00%
HGST	HUH728080ALE604	8TB	93	36,435	5	5.01%	0.60%	8.80%
HGST	HUH721212ALE600	12TB	2,606	3,274,145	27	0.30%	0.20%	0.40%
HGST	HUH721212ALE604	12TB	13,151	9,549,226	130	0.50%	0.40%	0.60%
HGST	HUH721212ALN604	12TB	10,690	15,719,532	290	0.67%	0.60%	0.70%
Seagate	ST4000DM000	4TB	18,070	74,646,649	5,258	2.57%	2.50%	2.60%
Seagate	ST6000DX000	6TB	884	3,945,301	96	0.89%	0.70%	1.00%
Seagate	ST8000DM002	8TB	9,467	23,270,753	816	1.28%	1.20%	1.40%
Seagate	ST8000NM000A	8TB	96	41,655	xx	0.00%	0.00%	4.90%
Seagate	ST8000NM0055	8TB	14,331	30,186,590	1,301	1.57%	1.50%	1.60%
Seagate	ST10000NM0086	10TB	1,159	2,413,509	120	1.81%	1.20%	2.10%
Seagate	ST12000NM0007	12TB	1,239	36,093,004	2,032	2.05%	1.90%	2.10%
Seagate	ST12000NM008	12TB	19,749	22,057,600	896	1.48%	1.40%	1.50%
Seagate	ST12000NM001G	12TB	12,805	10,718,697	226	0.77%	0.70%	0.80%
Seagate	ST14000NM001G	14TB	10,760	8,383,052	260	1.13%	0.90%	1.50%
Seagate	ST14000NM0138	14TB	1,497	1,296,971	189	5.32%	4.30%	5.10%
Seagate	ST16000NM001G	16TB	21,910	9,584,565	222	0.85%	0.80%	1.10%
Seagate	ST16000NM002J	16TB	310	78,215	2	0.93%	0.00%	3.330%
Toshiba	MD04ABA400V	4TB	94	349,668	10	1.04%	0.40%	1.60%
Toshiba	HDWF180	8TB	60	34,885	3	3.14%	0.30%	7.50%
Toshiba	MG07ACA14TA	14TB	38,156	33,737,232	854	0.92%	0.90%	1.00%
Toshiba	MG07ACA14TEY	14TB	577	391,133	18	1.68%	0.60%	2.00%
Toshiba	MG08ACA16TA	16TB	5,194	1,090,335	19	0.64%	0.50%	0.90%
Toshiba	MG08ACA16TE	16TB	5,932	3,017,252	109	1.32%	0.90%	1.60%
Toshiba	MG08ACA16TEY	16TB	5,288	2,439,952	36	0.54%	0.40%	0.70%
WDC	WUH721414ALE6L4	14TB	8,412	7,004,125	55	0.29%	0.20%	0.40%
WDC	WUH721816ALE6L0	16TB	2,699	1,444,994	6	0.15%	0.00%	0.30%
WDC	WUH721816ALE6L4	16TB	14,098	2,442,657	19	0.28%	0.10%	0.40%
TOTALS			236,983	355,158,698	13,660	1.40%		

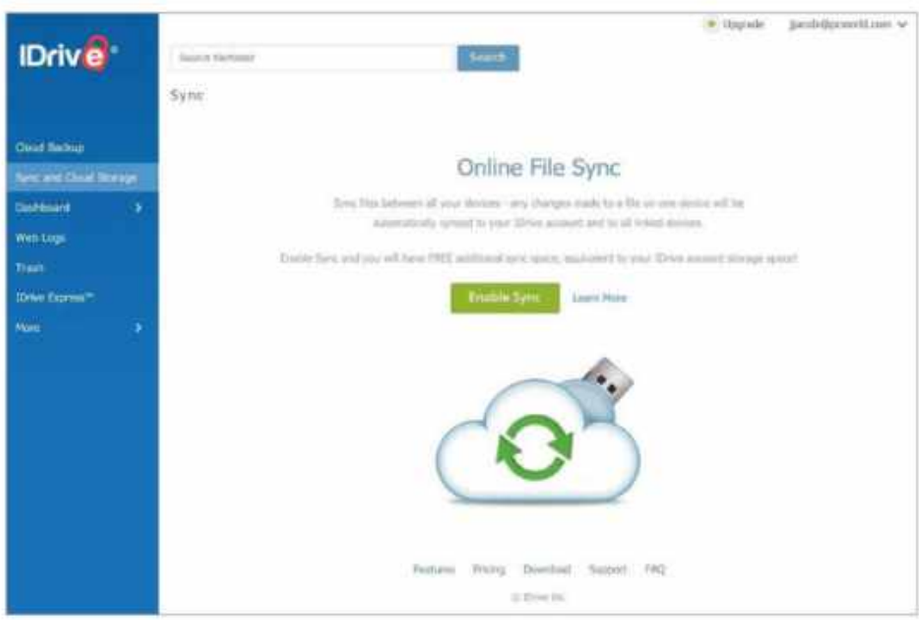
Reporting period: 4/20/2013 to 1/31/2023 for drive models active as of 3/31/2023.

Backblaze tested a number of drives, including Seagate's ST31500541AS (pictured).

year of service since Backblaze began tracking this data). So the likelihood of *your* storage dying is pretty low, especially considering that the drives in Backblaze's data centers are being run much harder than the one in an average person's computer.

Still, 1.4 percent of the millions of drives out in the world is a big number, and you won't know if you fall into that unlucky group until your drive stops responding. And that's a point that Secure Data Recovery stressed in its post, recommending the classic 3-2-1 approach. (See, tech journalists aren't trying to scare you unnecessarily.) That translates to three copies of your data on at least two different forms of media (such as two separate drives or one drive and the cloud), with one copy stored off-site.

Feeling overwhelmed by the idea of creating and maintaining that many copies of your data? It's actually not much work if you use the right tools. Our guide walks you through the basics of setting up a backup system (fave.co/3EApUU6). We've also got suggestions for the best automated backup software, external hard drives (fave.co/3n5NlMC), and cloud backup services (fave.co/3FWaMk6). Remember, a drive having a short life isn't the only reason to back up. You could end up on the wrong side of ransomware, your PC could get destroyed by an act of nature (or human), or someone might make off with your PC.



We recommend using a cloud backup service such as iDrive.

RIP passwords: Google accounts now support passkeys

Google is kicking off the death of the password on the eve of World Password Day. What a way to celebrate. **BY ALAINA YEE**

Managing passwords is pain. Tools exist to help (like password managers, fave.co/3lRkfRz) but staying on top of them remains dreary work.

But a new system for securing accounts is filtering through the web—passkeys. They take away a lot of the burden associated with passwords. You simply need a device capable of serving as an authenticator to set up a passkey, then you'll use a biometric method on that device (face identification, fingerprint) or a PIN to authorize logins. And after much anticipation, their rollout is starting to pick up steam—as evidenced by this week's launch of passkey support for Google accounts, right on the eve of World Password Day 2023.

Passkeys first started generating buzz last year when Google, Microsoft, and Apple all pledged to adopt them (fave.co/3BAbv9q). A form of passwordless sign-in based on

IMAGE: PEACHSHUTTERSTOCK/SHUTTERSTOCK

FIDO standards (fave.co/3IbdMfd), passkeys manage your login info through public-key encryption, also known as asymmetrical encryption (fave.co/42xpNDP), in which a public key and private key are generated. For a passkey, the public key is held by the website you're logging into, while you have the private key. You can store the private key to a device, but also sync it to an account for access from other devices. The two keys together let you get into the website. Google first started with support for storing passkeys in Chrome and Android back in October 2022. Now you can log into your Google account via passkeys, too.

Why would you want to use a passkey instead of a password when you already have a strong, unique password and two-factor authentication (2FA) set up (fave.co/3co510T)? Passkeys offer higher protection against data breaches. Google only has your public key, which can't be used to figure out your private key. Passkeys are also bound to the website they're generated for, which prevents bogus sites from stealing your credentials. Additional two-factor authentication isn't needed for added protection.

You don't have to move completely over to a passkey, however, especially if you still have questions about them after reading Google's easy-to-read overview (fave.co/42DaQA4) of how passkeys work. (I hope to address common concerns in a future article.) But the best way to understand how they work is to see them in action. Read on for instructions on enabling passkeys on your Google account.

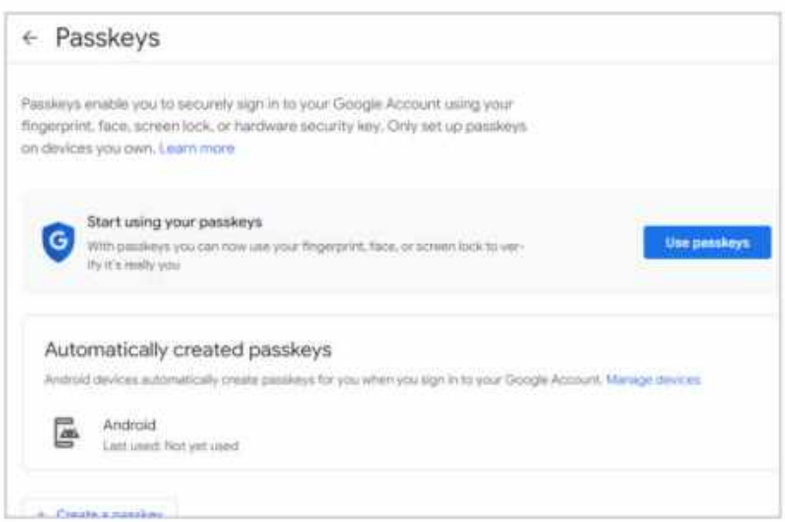
Note: At the time we tested this feature, no obvious option existed to remove passkeys once enabled. If you find that problematic, you can try passkeys on a different service where that outcome won't bother you.

HOW TO ENABLE PASSKEYS ON A GOOGLE ACCOUNT

1. Head to fave.co/3MgPSAi.

2. On the left side of the page, click on Security.

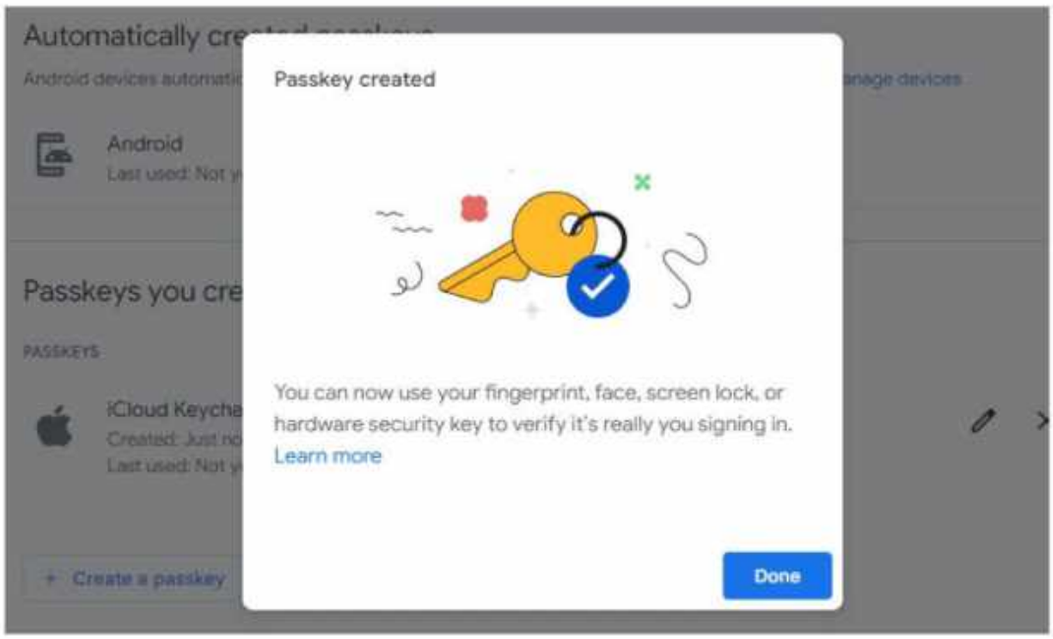
3. Under "How you sign into Google," click on Passkeys. If you don't see this option, you'll need first to click on "Use your phone to sign in" and link your account to a device like a phone or tablet.



The screen you'll see after enabling passkeys.

4. Click on the blue "Use passkeys" button.

Any Android devices you're logged into with your Google account will automatically be available for passkey setup. The actual creation of the passkey won't happen until you first authenticate via passcode and complete the process using the device, however.



The confirmation screen you'll see after adding another passkey to your account.

You can create other passkeys by clicking the white Create a passkey button. If you're on a PC that can't be used to create a passkey, you'll see a dialog box with a blue button to Use another device. Clicking on it will open another window with several options to choose from, including a different device. For that option, a QR code will appear that you'll scan with your phone or tablet's photo app. This is also the way to set up passkeys in a password manager. (Yep, such services are expanding and evolving rather than waiting to die.)

By the way, if you have two-factor authentication enabled on your Google account, it won't be asked for when you log in with a passkey. You'll only ever be asked for a second factor when logging in with your password. Since a passkey already requires something you know (the private encryption key stored on the device) and something you have (the phone), the thinking is that people don't need another layer for login.

The amount of time it takes to set up a passcode is breathtakingly fast, but its implementation is still unfolding slowly, as you can see from this list (fave.co/3pJDAsu) hosted by password manager 1Password. Speaking of, password managers (fave.co/3lRkfRz) haven't universally released passkey support yet—so far, NordPass and Dashlane (our favorite) appear to be first out the gate, though others like 1Password have plans to follow later in 2023. Passkeys are still in their early days, however. Adoption should spread faster as the months roll on.

Twitter check marks explained: What Blue, Gold, and Gray mean

Don't count on these definitions staying the same for long. **BY ALAINA YEE**

The saga of verified accounts on Twitter has reached its end. (Finally.) After months of beleaguered changes, the program that once identified notable accounts—like those held by journalists, major corporations, and public figures—has faded permanently into the past.

However, the blue check marks originally signifying verified status aren't disappearing. Instead their meaning is now different. Check marks of other colors have now joined the line-up, too.

You can boil the whole system down to a set of subscriber badges, with distinctions between each one. We've explained them for you below, but be warned: Twitter has continually shifted its approach to check marks and how they're applied to accounts. What's current now might not be so in even just a couple of weeks.

As for being sure a Twitter account is official, you'll now need to verify the account

IMAGE: RAFAPRESS/SHUTTERSTOCK

name (that is, cross-check against an official website) on your own.

BLUE CHECK MARK

Prior to Elon Musk's takeover of Twitter, a blue check mark meant an account was verified—that is, the person's identity had been confirmed. This distinction made it easier for people to trust that an account was truly held by a notable entity, like a business, government official, journalist, or other public figure or brand. These legacy verified accounts lost their badge on April 20.

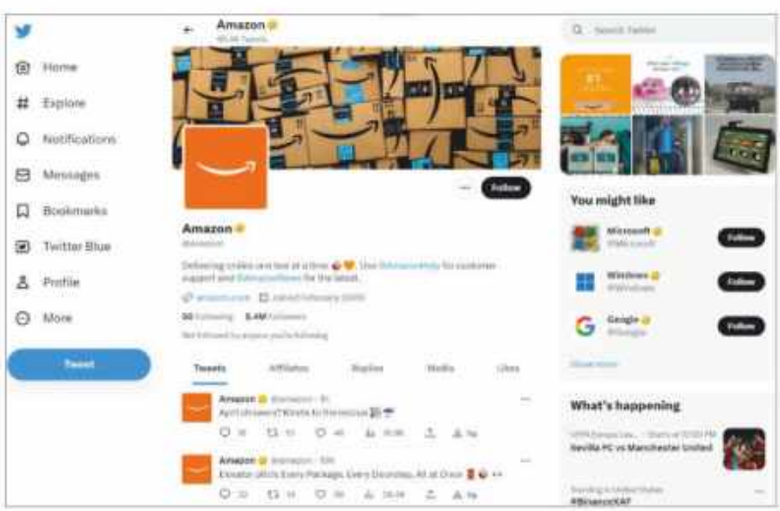
Now that blue check mark signifies that the account is subscribed to Twitter Blue (fave.co/3HA4ucX). For $8 per month via the web (or $11 per month via iOS and Android), eligible accounts get the badge plus extra features like reduced ads, the ability to edit tweets, longer tweets up to 10,000 characters, and text formatting. To be eligible, an account must be active within the last 30 days, have a display name, photo, and a confirmed phone number, and cannot impersonate another account or entity. (That last requirement is likely due to the chaos that unfolded [fave.co/3BRTaFv] when Twitter Blue first gave check marks to subscribers immediately.)

Accounts with one million or more followers also appear to be getting the blue check mark automatically—in some cases, against the express wishes of the account holders. In other instances, the mark has been applied to high-profile accounts belonging to deceased public figures.

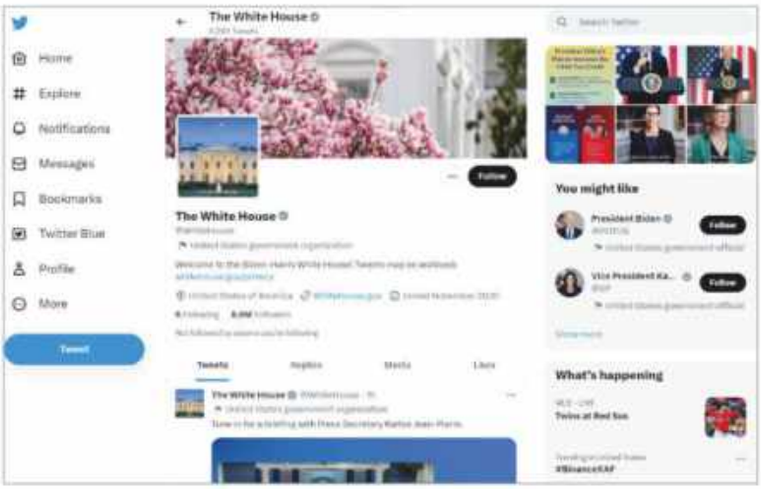
GOLD CHECK MARK

Twitter is hurting for cash, and it wants subscription money from those who can really pay for it: businesses. Companies that participate in Twitter's Verified Organization program (fave.co/3Oaj7Hq) get a yellow check mark to indicate their participation, as well as a square avatar icon, Twitter Blue features, and the option to add affiliate accounts (that is, individuals, divisions, or sub-brands affiliated with the organization).

Given the subscription cost—$1,000 per month in the U.S.—it's less likely that you'll encounter a false account for, say, a bank or other major institution, but not impossible.



An example of a gold check mark on a Twitter account held by a business.



An example of a gray check mark on a Twitter account held by a government agency.

The terms and conditions of the program don't describe an actual verification process (fave.co/432A36M). Twitter no longer has a media relations team to field questions on this point, either.

GRAY CHECK MARK

A variant of the Verified Organizations mark, this flavor of subscription badge signifies a government organization or official—or a multilateral institution like the United Nations.

Twitter previously used this icon to also identify media outlets, but that policy has now changed to identifying such organizations with a gold check mark. Labels further identifying media with ties to government appear to have disappeared as of April 21, along with the company's help page that explained its definition of state-affiliated media (fave.co/3pHtFUe). Meanwhile, rival Facebook still maintains its policy of labeling outlets with direct government control over editorial content (fave.co/3M5GwqV).

This change closes a brief period in which news outlets typically regarded as independent showed a gold check mark along with a label identifying them as government-funded. High-profile examples included NPR (fave.co/3W8nbtz), which chose to discontinue using Twitter (fave.co/3Mw0EUr) altogether, and the Canadian Broadcasting Company (fave.co/3OijYWu).

When the CBC explained its funding, Twitter adjusted the account's label as state-funded media to include the following detail:

According to a Reuters report (fave.co/3BxAsTg), the CBC is 58 percent funded through government sources.

The number here was not based on straight math.

I paid for Microsoft Windows. Why does it push ads on me?

Microsoft should bug people who don't activate their copies of Windows, if they have to poke at someone. **BY ALAINA YEE**

That copy of Windows on your PC was paid for by someone—generally the vendor who sold you the computer. In my case, I paid for it myself as a DIY builder.

So why does Microsoft nag me to use its product the way it thinks I ought?

It started in ads in Windows 10 (fave.co/42XALIO) about operating system features and other Microsoft products, which partially cooled off. (Thankfully.) But we're about to hit a new peak in Windows 11, where alerts will spread beyond the notification center. Now those kinds of ads are headed for the start menu (fave.co/432Dien). Not only that, but they're set to badger people with local accounts (fave.co/3pHCygy), highlighting reasons to sign in with a Microsoft account.

Y'all. Respectfully, no.

First off, who ever won anyone over by annoying them? I've spent years of my life as a Californian ignoring Prop 65 warnings (fave.co/3M9RvzF). (Okay, that's a lie—I am the kind of person who still notes which products

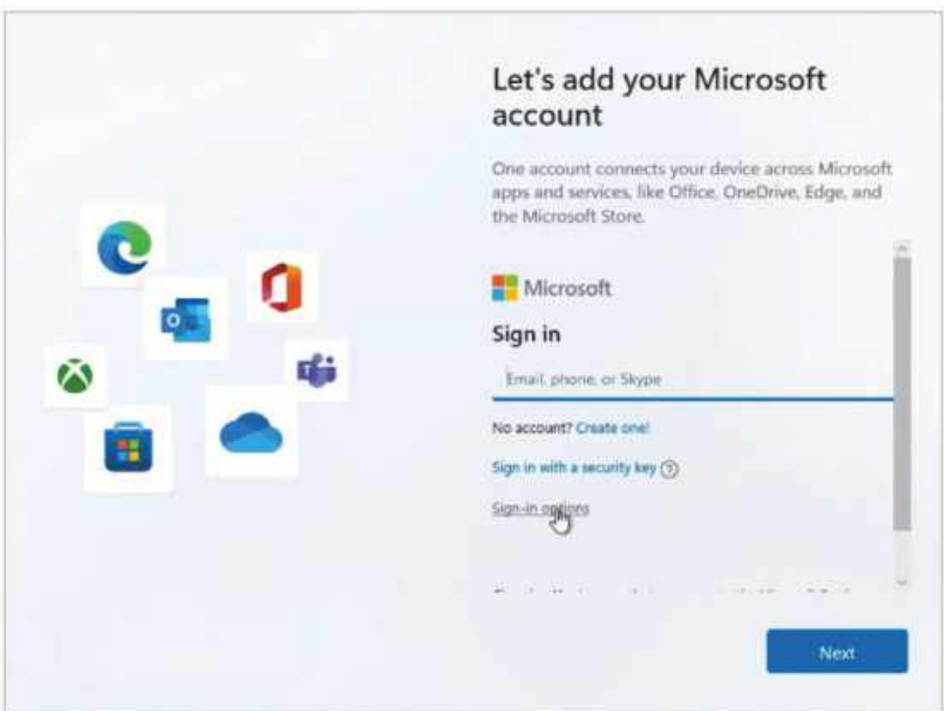
IMAGE: MICROSOFT

If you 're old enough to rent a car, you'll remember this annoyance from days gone by.

have them, but they are excessive.) More to the point, Microsoft can't have forgotten how much we all hated Clippy (fave.co/42xlY0h). Twenty years is a long time, but not that long for a corporation of its size. If users haven't adopted your suggestions, it means they're not interested. Pushing us only causes dislike for the recommended products and services.

Second, as a local account user who has watched the ground crumble around her, I don't appreciate being badgered about a conscious life decision. One that is *incredibly* deliberate, given how difficult it is (fave.co/3Bw4ZRa) to set up a local account in Windows 11. I didn't accidentally click the wrong button and end up with one.

When I pay for a product or service, I expect to be able to use all of its features without issue. At the start, I'll take recommendations on hidden features, as well as potential dangers of the settings I've chosen. That's reasonable and helpful. I'll also tolerate another round of



Setting up a local account is ridiculously hard.

reminders early on. But for this situation, where it's pretty obvious that only experienced (and determined) users would still pursue a local account option, Microsoft's pop-ups feel like a iron fist move, with only a thin velvet glove guiding me toward the company's preferred outcome—not mine. You know who rules with a heavy hand? Apple. You know what products I don't use as daily drivers (fave.co/3Mw9em7)? Apple's.

Microsoft 365 is a good paid service, as these things go, but shoving it into people's faces isn't going to attract people (fave.co/3BuaYpP).

Third, I may not own a product with a software license, but I still gave someone money and I don't expect to be low-key harassed in exchange. When Windows 10 first launched its ads, I thought they were fair. Irritating, but fair. Microsoft made upgrades free—something they'd never done before—so I understood why they'd remind people about Microsoft 365.

But Microsoft doesn't seem to understand that at the very least, it needs to make distinctions between types of users. Paid license for Windows 10 or 11? No nags. Twisted myself into a pretzel in order to keep a local account? No nags. Upgrade from Windows 7 or 8? Fine, hit me with your attempts to separate me from my money (or get access to more data about me and my habits).

I've already written about how working in Windows 11 depresses me (fave.co/3IhGcnE). I think it's a shame that Microsoft keeps implementing further ways to discourage positive associations with its latest operating system. I'm pretty sure many hardworking teams contributing to Windows just want to put the best possible product forward. But as any teenager can tell you, repeated reminders to do something or try something don't work. Adults really aren't that different. We just have more money—and basic expectations when we spend it.

(P.S.—Linux users, I am not interested [fave.co/3OezAu0] in your favorite and probably esoteric distro that would never behave this way.)

MADDY TURNED HATE
INTO HOPE
AND STARTED A MOVEMENT
Maddy Park
Founder,
@CafeMaddyCab
In 2021, the rise of violence against the Asian community made even the simple act of taking public transportation unsafe. So, Maddy started a fund to pay for cab rides for those in the Asian community that needed it most, including women, the elderly, and the LGBTQ+ community. With over $100,000 raised in just two days, she started a movement based on love that lives on today.
love has no labels
ad COUNCIL
Join Maddy's cause and get the tools to support the Asian community now at
LoveHasNoLabels.com

Dell XPS 15 (2023): A real do-it-all powerhouse

This laptop has a lot to offer. **BY MATTHEW S. SMITH**

PCWorld EDITORS' CHOICE

The Dell XPS 15 is an elder of the laptop world. It carries itself with a stately, reserved manner, and wouldn't dream of troubling itself with trivialities like a radical new colorway or different badging. 2023's XPS 15 keeps the pomp but delivers one major improvement: It's a lot quicker than before.

SPECS AND FEATURES

The 2023 Dell XPS 15 leaps to Intel's 13th-gen Core processors and Nvidia's RTX 40-series graphics. The top-tier GPU is kicked up two rungs from the RTX 3050 Ti in the outgoing model (fave.co/3zfdq2Q) to the RTX 4070 in the new XPS 15.

CPU: Intel Core i7-13700H

Memory: 32GB LPDDR5

IMAGE: DELL

Graphics/GPU: Nvidia RTX 4070 (40-watt TGP)

Display: 15.6-inch 3.5K OLED

Storage: 1TB PCIe Gen4 SSD

Webcam: 720p

Connectivity: 2× Thunderbolt 4/USB-C with Power Delivery and DisplayPort Alternate Mode, 1× USB-C with Power Delivery and DisplayPort Alternate Mode, 1× SDcard reader, 1× 3.5mm combo audio

Networking: WiFi 6E, Bluetooth 5.3

Biometrics: Windows Hello fingerprint, facial recognition

Battery capacity: 86 watt-hours

Dimensions: 13.57×9.06×0.71 inches

Weight: 4.21 pounds

MSRP: $2,799 as tested ($1,499 base)

The review configuration, which included the top-tier GPU and upgraded OLED display, rang up at $2,799. Base models are more affordable, however, with an MSRP of just $1,499. That drops the graphics to Intel's Arc A370 and the display to a 1080p IPS screen, but you still receive an Intel Core i7-13700H processor, 16GB of RAM, and a 512GB solid state drive.

The XPS 15 (2023) is slim and light for its size.

DESIGN AND BUILD QUALITY

Dell's XPS product line settled on a design language in the middle of the last decade and hasn't changed since. It's a bit dull, to be sure, but shows a hard-won confidence in the fundamentals of the XPS design language. It may look the same as past XPS 15 models, but it's also handsome and feels durable. That's what matters.

Looks aside, the XPS 15 is rather slim and light for its size. It tips the scales at 4.23 pounds when configured with the OLED display found in my review unit and measures a mere 0.71 inches thick, as well as roughly 13.5 inches across and 9 inches deep. The XPS 15 is a bit smaller than a MacBook Pro 16 or Razer Blade 16 (or Blade 15, fave.co/42JiHMG) and weighs less, too.

The XPS 15 earns top marks in build quality with rigid panels across the top and bottom and plenty of

reinforcement through the keyboard. Display flex is a nonissue, and even the firmest typing hands will cause only a hint of wobble across the keyboard surface.

The spacious keyboard offers plenty of room to maneuver while typing.

KEYBOARD, TRACKPAD, PEN

The Dell XPS 15 has a spacious keyboard with a centered layout. I found it immediately familiar and had plenty of room to maneuver while typing at high speeds. The centered layout ditches the numpad, however, which may bother those aiming to compete in the Microsoft Excel Championship (really, it's a thing).

Key feel is good but unremarkable, with reasonable key travel and a timid bottoming action that provides only a hint of tactile feedback. It's similar to an Apple MacBook Pro 16 and a touch improved over Razer's Blade 16, but it can't beat Lenovo laptops like the Slim Pro 7 (fave.co/3MylQIg). Keyboard backlighting is standard and does the job with little fuss.

Dell's spacious touchpad measures about 6 inches wide and 3 inches deep. That's large for any laptop and makes maximum use of the spacious interior. The touchpad is responsive and easily handles multitouch gestures, but it occasionally picks up unintended inputs when typing. Even so, it's a good touchpad and comfortable to use for hours on end.

DISPLAY, AUDIO

The entry-level Dell XPS 15 has a 15.6-inch 1080p IPS nontouch display, but my test laptop enjoyed an upgrade to the 3.5K OLED touchscreen. The display's 3456×2160 resolution places it just short of true 4K (which has a resolution of 3840×2160), but it looks sharp all the same, squeezing an impressive 261 pixels into every inch. Fine fonts look excellent and games appear extremely crisp when run at the display's native resolution.

Image quality is otherwise excellent. OLED provides an excellent contrast ratio, wide color gamut, and good color accuracy,

all of which adds up to a vibrant, punchy image with a tangible sense of realism and depth. High-quality content, like a 4K movie ripped from a Blu-Ray or purchased from a digital store, seems to leap out from the display in dynamic, high-contrast scenes.

OLED isn't perfect, however, and brightness is a struggle. The laptop quotes a maximum brightness of 400 nits and achieved 403 nits in testing. This, combined with the glossy display coat, can make the display a tad uncomfortable in bright rooms. The lack of brightness spells trouble for HDR, which looks good but lacks brilliance and luminance detail compared to a Mini-LED display, such as those found in the Razer Blade 16 and Apple MacBook Pro 16.

Shoppers who care more for function than image quality should consider sticking with the less expensive 1,920×1,200 IPS screen. Though nowhere near as attractive, it offers a higher maximum brightness of 500 nits and has an anti-glare finish.

A pair of upward-facing speakers is placed alongside the XPS 15's keyboard. They deliver strong, clear audio that won't be muffled or amplified by the surface the laptop is placed on. Distortion is an issue at high volume, however, as the bass crowds into the midrange and highs begin to sound shrill. Music sounds better at lower volumes, thankfully, and this remains loud enough to fill a home office with tunes.

WEBCAM, MICROPHONE, BIOMETRICS

A meager 720p webcam squeezes into the XPS 15's tiny top bezel. Sticking with 720p prevents the need for a webcam cut-out or larger bezel but comes at the cost of a fuzzy, ill-defined image. It's OK for video calls but will never help you look your best.

Image quality on the OLED display is excellent.

The dual-array microphone is better, recording clear, clean dialogue that's easy for listeners to understand. Audio quality remains rather tinny, however. The included noise cancellation is effective, removing repetitive sounds of modest volume with no ill effects.

A fingerprint reader is provided on the power button for quick biometric login. It works as well as any Windows

fingerprint reader I've tried—which is to say it usually works but can have trouble if your finger is dirty, wet, or placed at an odd angle. Windows Hello facial recognition is also available and much more reliable, as it works in both light and dark conditions and can be set up to recognize you with or without glasses.

As well as three USB-C ports, the XPS 15 (2023) has a full-size SDcard reader and a 3.5mm audio jack.

CONNECTIVITY

Dell is all-in on modern connectivity, ditching both USB-A and Ethernet in favor of three USB-C ports. Two of these support Thunderbolt 4 and all three support Power Delivery. That means the included 130 watt power adapter, which uses USB-C, can charge the laptop through any of the three USB-C ports.

The XPS 15's flanks also contain a full-size SDcard reader and 3.5mm audio jack, but that's it. Those who still use older USB-A devices, or who need an HDMI or DisplayPort output, will need to use an adapter. Fortunately, XPS 15 ships with an adapter that converts a USB-C port to USB-A and HDMI.

That still leaves wired Ethernet in the cold. You'll need to buy an additional adapter or a USB-C hub/dock that supports Ethernet.

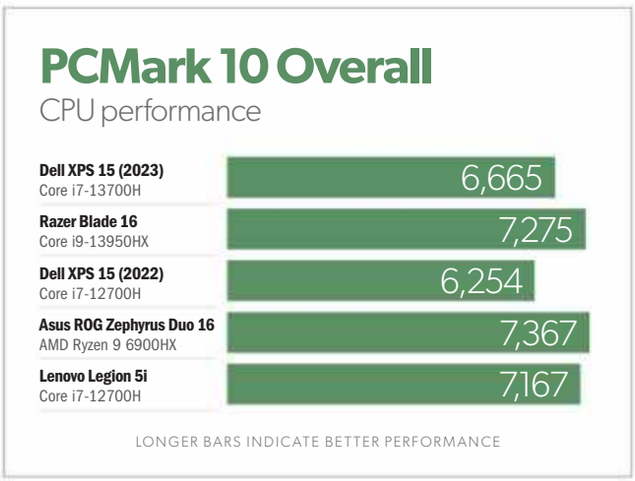
Or perhaps not. The XPS 15 supports the latest Wi-Fi 6E standard as well as Bluetooth 5.3. Wi-Fi performance was strong, with download speeds up to 80MB/s from Steam and The Epic Store. That's almost as quick as the speeds I receive from my Gigabit Internet service connected over wired Ethernet.

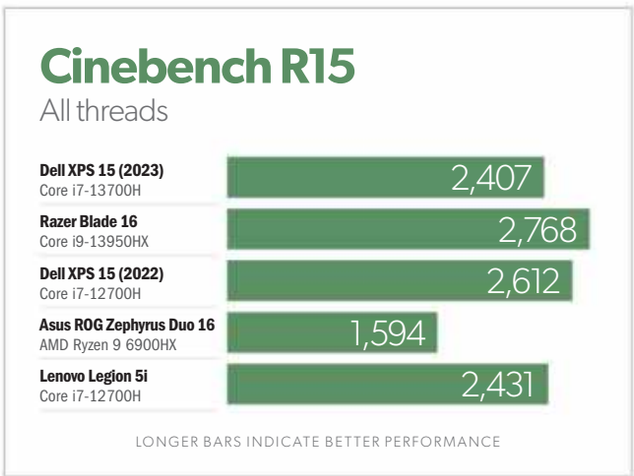
PERFORMANCE

The Dell XPS 15 I received was a midrange model with an Intel Core i7-13700H processor, Nvidia RTX 4070 graphics, 32GB of RAM, and 1TB NVMe solid state drive. Dell offers some upgrades from here, including a Core i9-13900H processor and up to 64GB of memory.

PCMark 10, a holistic benchmark, kicks off the tests with a mediocre score of 6,665. This is notably behind some other powerful laptops, though it's worth mentioning that the Dell XPS 15 is lighter and thinner than the laptops it loses to. The XPS 15 does manage a leap over last year's model, however, scoring 6 percent better.

I was certainly surprised by the Cinebench R15 test, which shows the older Dell XPS 15 a



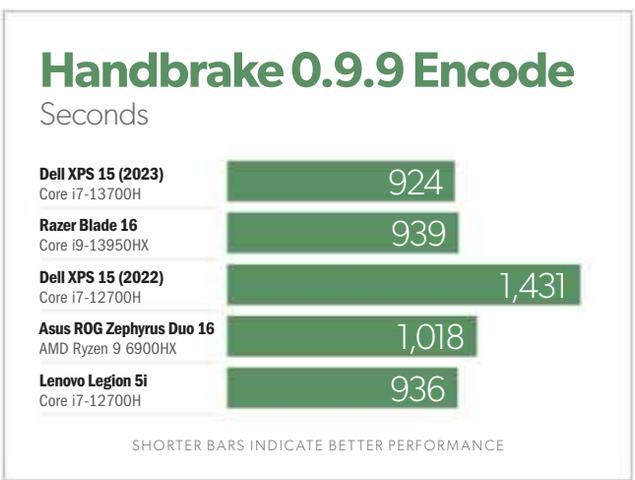


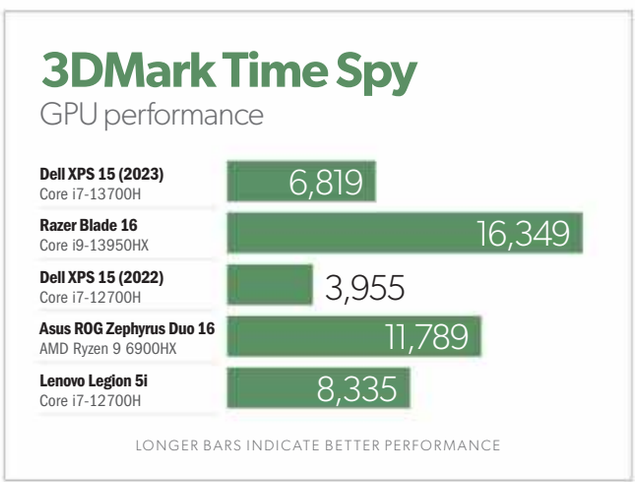
tad ahead of the new model. The new XPS 15 also falls a tad behind the Lenovo Legion 5i, another laptop with Intel 12th-gen Core hardware. This indicates that the multicore performance of Intel's new Core i7-13700H is not much different from that of the prior model.

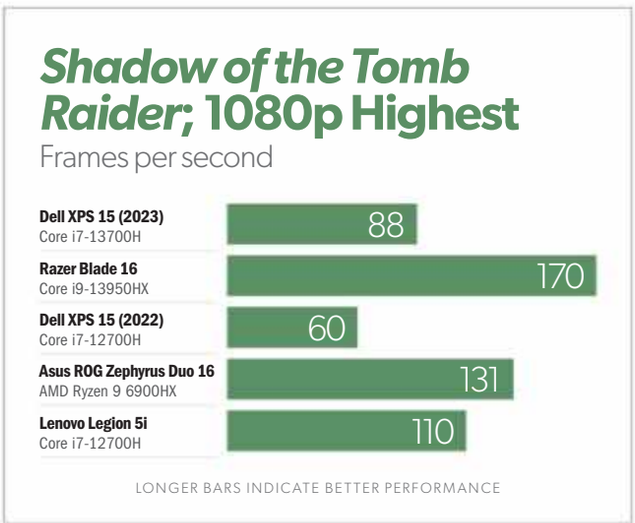
Handbrake, on the other hand, shows a significant win for the new Dell XPS 15 over the prior model, though it also still more or less ties the Lenovo Legion 5i with the old Intel Core i7-12700H. The most significant takeaway from this test is that design matters. There's significant variance between laptops with the same processor, which may cause results to bend outside of what's expected.

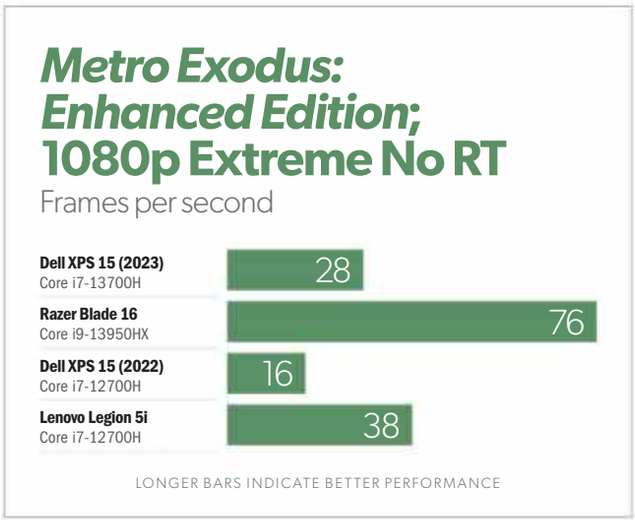
3DMark Time Spy brings us to the graphics benchmarks—and wow, the new Dell XPS 15 delivers here. Upgrading from an RTX 3050 Ti to an RTX 4070 increases performance by an amazing 72 percent.

With that said, this result also marks a clear difference between the Dell XPS 15, a premium performance laptop, and peers that fall into the gaming laptop category.









Competitors that focus on gaming toss in much more powerful GPUs and reap the benefits in 3D benchmarks (though they pay for that in battery life, as I'll show shortly).

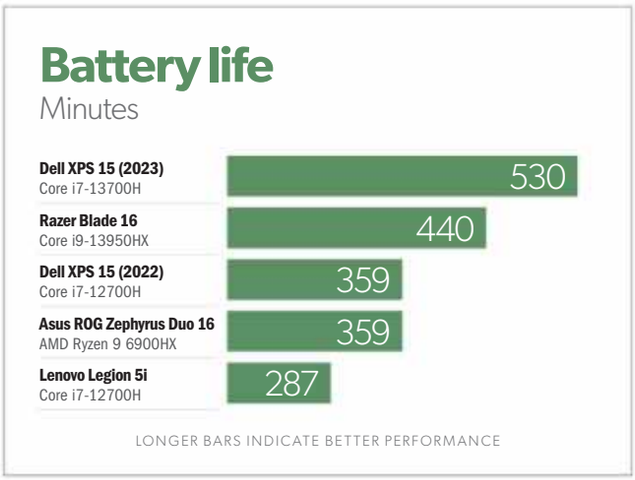
Shadow of the Tomb Raider delivers another big improvement but, once again, marks a clear line between the XPS 15 and full-on gaming laptops. I still feel this result is a positive, however, as it means the Dell easily provides a fluid 60 FPS gaming experience. The older model could average 60 FPS, but would sometimes dip below that mark, which can cause stutters or dips in fluidity.

Metro Exodus demonstrates another game-changing improvement, improving the average frames per second from an unplayable 16 FPS to a barely tolerable 28 FPS. That may seem a bit disappointing, but the Extreme settings we use are quite extreme, and the Dell XPS 15 is just a few minor detail tweaks from a steady 30 FPS.

I also ran *Cyberpunk 2077* to judge the laptop's ray-tracing performance. The RTX 4070 in the XPS 15 averaged only 20 FPS at 1080p with Ultra detail settings and Ultra ray-tracing enabled. However, turning on DLSS 3 boosted that to a steady 60 FPS, which means *Cyberpunk 2077* ray-tracing is completely playable on the XPS 15. It even manages 35 FPS in the brand-new Overdrive ray tracing mode, again at 1080p and with Ultra detail and DLSS 3 turned on.

The new Dell XPS 15 clearly benefits from its new hardware. The Intel Core i7-13700H is not a remarkable improvement, but seems a tad quicker on the whole. Nvidia's RTX 4070, on the other hand, is a gigantic leap over the old model's RTX 3050 Ti. The new model's MSRP is only $200 more, so it's not as if the better GPU completely blows up the price.

These improvements change the nature of the Dell XPS 15. The prior model was attractive and offered powerful CPU



performance, but it was hard to recommend to anyone who wanted to play modern 3D games after work. Dell's new XPS 15 with RTX 4070 changes that. It's now a fully capable gaming laptop that can play nearly all modern games at 1080p and 30 to 60 FPS, even when high detail settings are used.

BATTERY LIFE

Dell crams a large 86 watt-hour battery inside the XPS 15. This isn't the largest battery found in a laptop of this size, as some competitors exceed 90 watt-hours, but it delivered excellent battery life in my testing.

The XPS 15 looped a 4K trailer of the short film *Tears of Steel* for 8 hours and 50 minutes. That's not the best available from a Windows laptop, but a solid result for this category and a large improvement over the outgoing XPS 15. Owners will need to monitor the laptop closely to squeeze out a full workday of real-world use, depending on the apps most frequently used, but it's close.

BOTTOM LINE

Dell's new XPS 15 is much like the old XPS 15, but faster. *Much* faster. The one-two punch of new Intel 13th-gen processors and Nvidia RTX 40-series graphics provides real-world upgrades over the prior model.

The old XPS 15 was a respectable workhorse but not always an impressive performer, especially in 3D games. The new model is perfectly capable of handling even the most demanding modern titles at 60 FPS—when packing the RTX 4070, at least.

There is still room for improvement. The touchpad can be overly sensitive and the webcam could use an upgrade. Still, these problems don't detract from the XPS 15's slim design, high build quality, and strong performance, and it remains a go-to pick for those craving a premium laptop that offers a balance of portability with speed.

Dell XPS 15 (2023)

★★★★½

PROS

- Excellent design and build quality.
- Thin, light for its size.
- Attractive OLED display.
- GPU performance gets a big upgrade.

CONS

- No USB-A, HDMI, or Ethernet ports.
- OLED display could be brighter.

BOTTOM LINE

Dell's new XPS 15 equips the latest Intel and Nvidia hardware to deliver big performance gains with little downside.

$2,799

Gigabyte Aorus Gen5 10000: The first PCIe 5.0 SSD makes a splash

This first-generation PCIe 5.0 SSD offers easily the fastest sustained transfer rates of any drive we've tested. **BY JON JACOBI**

PCWorld EDITORS' CHOICE

Gigabyte's Aorus Gen5 10000 is easily the fastest single NVMe SSD we've tested. Being the first PCIe 5.0 drive we've tested, that's hardly surprising. But it is quite delightful to see a drive sustain reads and writes over 10GBps.

SPECS

The Aorus Gen5 10000 wouldn't be much to look at on its own. It's your usual 2280 (22mm wide, 80mm long) M.2 NVMe SSD with a plainish black label. That's if you omit the massive heatsink that Gigabyte provides. And I mean massive. See below.

IMAGE: GIGABYTE

The huge heatsink that accompanies the Auros Gen5 10000 in the box.

This heatsink is overkill for most users, and during our benchmarking the drive ran relatively cool, never once threatening to throttle during multiple benchmark runs.

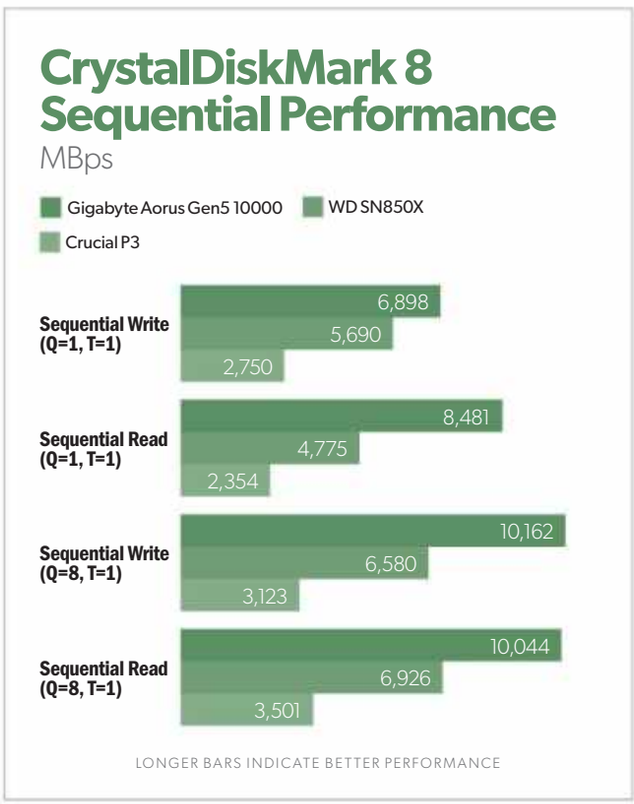
The Gen5 10000 uses Phison's new E26 controller and the latest 232-layer 3D TLC NAND. Though the drive is not widely available yet, we did see it available online for $340 in the 2TB flavor we tested. That's roughly twice what a bargain 2TB PCIe 4.0 drive will cost, and three times the price of a PCIe 3.0 SSD.

The drive is covered by a limited five-year warranty. The limit is a 700TBW (terabytes that may be written) per 1TB of capacity rating. That's not very generous given the rather steep pricing, though some of that pricing reflects the presence of the huge heatsink.

PERFORMANCE

Does PCIe 5 make a difference? Yes—big time, if you go by synthetic benchmarks; marginally, if you go by real-world transfers. As you can see below, the Aorus Gen5 10000 destroyed the competition in CrystalDiskMark 8's sustained throughput tests.

Said competition was the WD SN850X (fave.co/431GEyh), the fastest PCIe 4.0 SSD we've tested, and the Crucial P3 (fave.co/3HY15Fn) which is a very fast



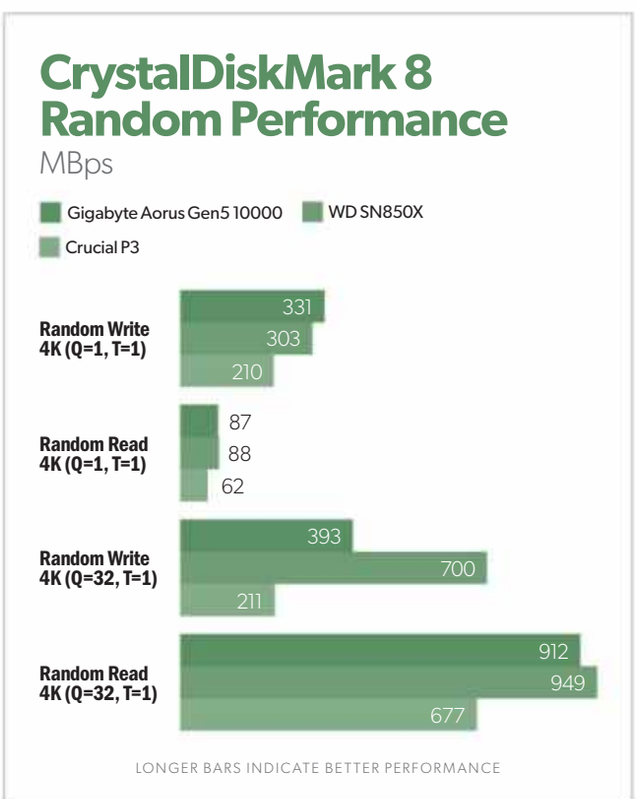
If the CrystalDiskMark 8 numbers translated into real life, you'd be talking massive gains in performance. Alas, they are only partially applicable.

entry-level PCIe 3.0 SSD. The three drives should give you a good idea of the relative performance across the generations of PCIe. Note that the Gen5 10000 is also NVMe 2.0 where the others are 1.4 max.

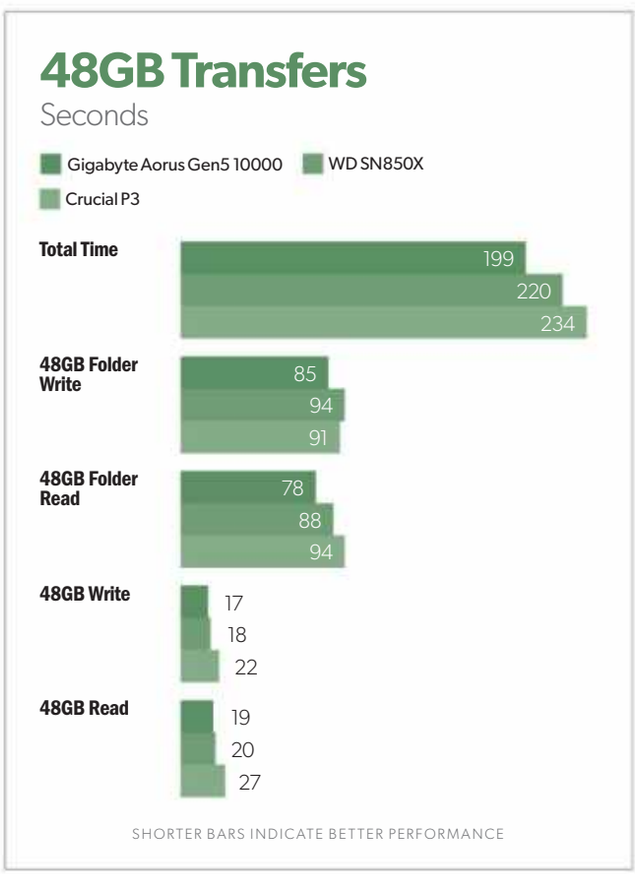
Sobering the discussion quite a bit is the lack of effect that PCIe 5.0 seems to have with random performance. Indeed, if these numbers are to be believed, you're better off running your operating system with the WD SN850X than the Aorus Gen5 10000. Save the latter for large file transfers.

In our real-world 48GB transfers, the Gen5 10000 is indeed faster than previous generations, but again, not by the same large margins we saw in the synthetic benchmarks. Note that there are PCIe 4.0 SSDs that are even faster in this test than the SN850X.

Again, during our 450GB write test shown below, the margin of victory, while welcome, was decidedly underwhelming. However, this test is also dependent upon the drive transferring the file (a Samsung 990 Pro). We actually run this test to see if the transfer bogs down at any point due to lack of or poor secondary NAND caching (writing as single-bit SLC rather than three-bit TLC).



Random performance seems far less affected by PCIe 5.0's greater bandwidth. In fact, as you can see, the Gen5 10000 lost badly to the WD SN850X.

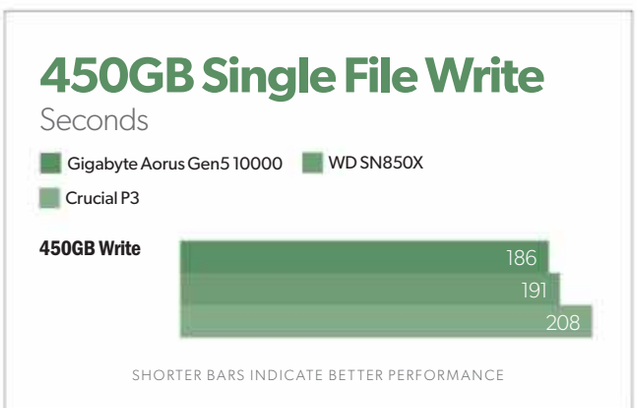


While the Gen5 10000 offers a noticeable improvement in our 48GB transfers, it's not nearly the margin you get in synthetic benchmarks.

All three drives are 2TB, meaning secondary cache shouldn't factor in, and didn't slow at any point.

One thing I did notice is that the Gen5 10000 is relatively slow at formatting, taking up to 15 seconds. I've experienced this with other SSDs on occasion. It may be that the drive is housekeeping the NAND so that it's cleared and ready for action without incurring erase-before-write performance penalties before the next TRIM operation occurs.

Internal drive tests currently utilize Windows 11 64-bit running on an X790 (PCIe 5.0) motherboard/i5-12400 CPU combo with two Kingston Fury 32GB DDR5 modules (64GB of memory total). Intel integrated graphics are used. The 48GB transfer tests utilize an ImDisk RAM disk taking up 58GB of the 64GB total memory. The 450GB file is transferred from a Samsung 990 Pro 2TB.



Though 5 seconds is a nice improvement, subjectively it would be hard to notice. Note that this test is also dependent upon the drive (a Samsung 990 Pro) delivering the file. This test is designed to reveal issues with secondary caching, not necessarily real-world performance.

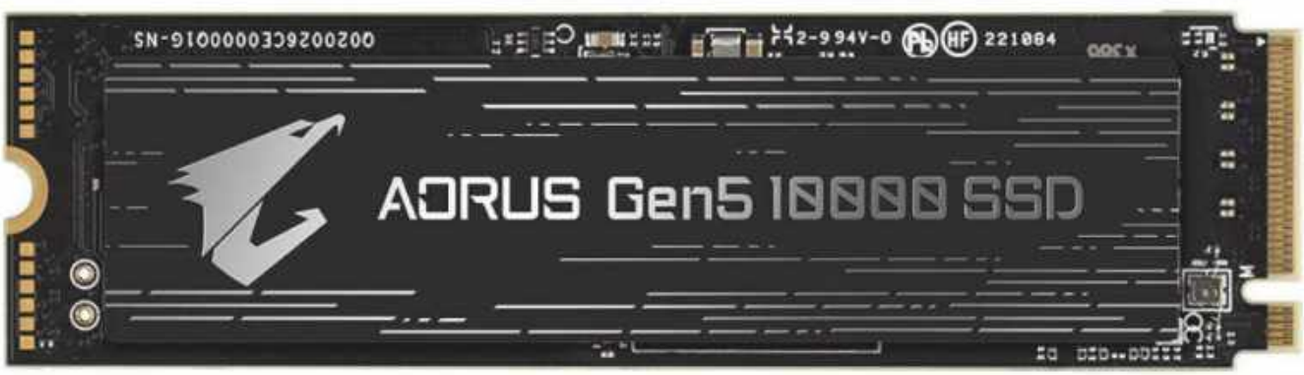
Each test is performed on a newly formatted and TRIM'ed drive so the results are optimal. Note that in normal use, as a drive fills up, performance will decrease due to less NAND for caching, as well as other factors.

The performance numbers shown apply only to the drive we were shipped and of the capacity tested. SSD performance can vary by capacity due to more or fewer chips to shotgun reads/writes across and the amount of NAND available for secondary caching. Vendors also occasionally swap components. If you ever notice a large discrepancy between the performance you experience and what we report (systems being roughly equal), please let us know.

Note that PCWorld just updated its test bed to a new platform with PCIe 5.0 M.2, as well as onboard Thunderbolt/USB4 and 20MBps USB. The test bed now uses integrated Intel graphics in lieu of a discrete GPU. All the SSDs listed in the charts were retested on the new platform, so the numbers may not match those in their individual reviews.

PLATFORM

There's, of course, the elephant in the room: the relative lack of PCIe 5.0 support for SSDs. Though PCIe 5.0 is no longer a rarity in mid- to high-priced motherboards, M.2 slots that support it are. Indeed, picking the motherboard for our test bed was a chore because of this. Also, there's a dearth of PCIe



The Gigabyte Auros Gen5 10000 is the fastest NVMe SSD we've seen.

5.0 M.2 adapter cards for utilization in the far more common PCIe 5.0 slots.

Then there's the need for a late-model CPU. Only Intel's 12th- and 13th-gen processors support PCIe 5.0. None of the current Intel chipsets do, so the platform controller hub is still limited to PCIe 4.0.

AMD's latest Ryzen CPUs support PCIe 5.0 and offer quite a few more lanes, so it's easier to run both graphics cards and SSDs at the new standard. That had us interested, but Intel's native support for Thunderbolt 4/USB4, which we need to test occasionally, was the difference maker, along with price.

If our considerations aren't yours, then you're just as well off with AMD for PCIe 5.0 SSDs.

BOTTOM LINE

There's no doubt that the Aorus Gen5 10000 is the fastest NVMe SSD for sustained throughput that we've tested. On the other hand, it's pricey, and you of course need a PCIe 5.0 M.2 slot to take advantage of it. If you have the cash, and your system qualifies, you'll like it. And you'll know that you're getting some of the fastest performance available.

That said, a good PCIe 4.0 SSD will save you money, give you nearly the same subjective performance, and quite possibly run your OS more efficiently. Consider the purchase carefully.

Gigabyte Aorus Gen5 10000

★★★★½

PROS

- Fastest sustained performance we've seen.
- Massive heatsink for gamers.
- State-of-the-art PCIe 5.0 and NVMe 2.0.

CONS

- Relatively weak random performance.
- Low TBW rating for the price.
- Requires the rare PCIe 5.0 M.2 slot.

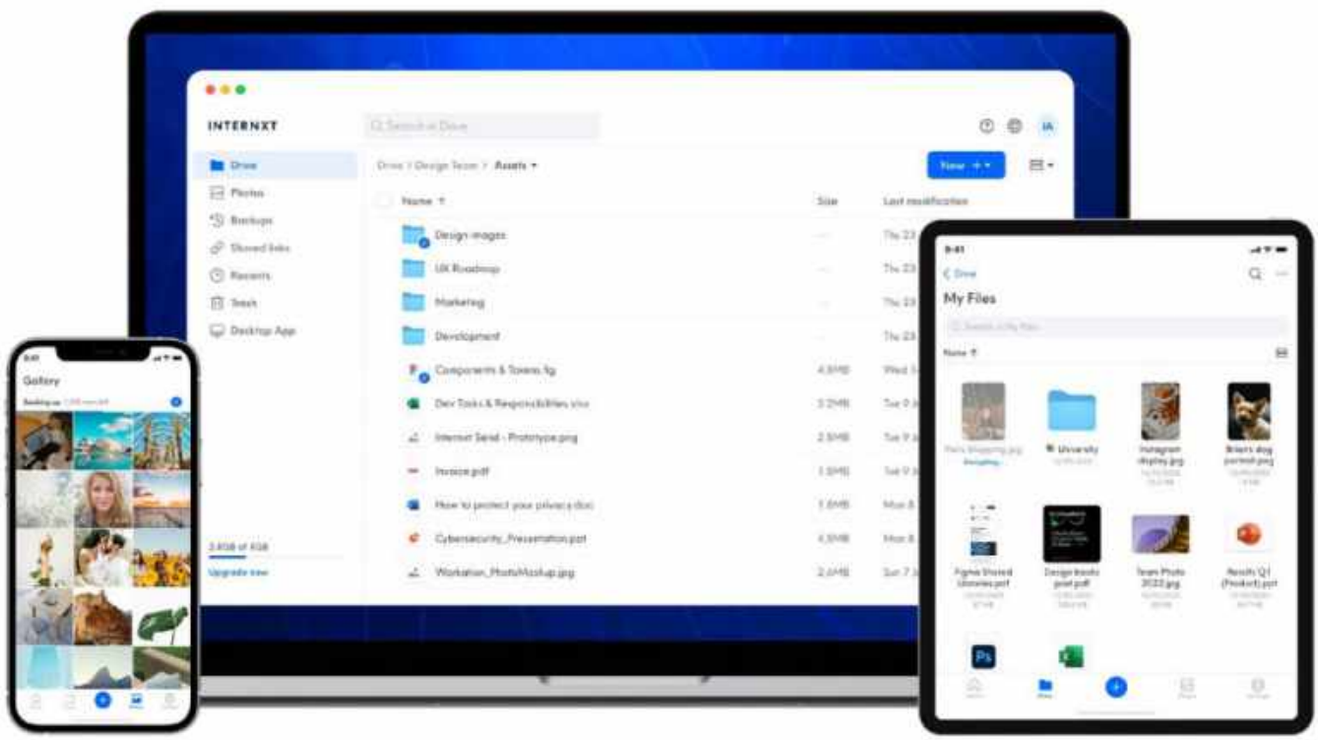
BOTTOM LINE

Though the Aorus Gen5 10000 offers superfast sustained transfers, it's pricey and has the same random performance as cheaper PCIe 4.0 SSDs.

$340

Internxt Drive: Affordable storage, sync, and backup

This online storage and backup service is easy, covers all the bases, and quite frankly, the lifetime plans are a steal. **BY JON JACOBI**



PCWorld EDITORS' CHOICE

Though Internxt Drive rightfully touts its 256-bit encryption and dedication to privacy, there's no function in particular that sets it apart from the crowd. As with services such as Dropbox, Sync.com, OneDrive, iDrive, and so on, there's sync and storage. And as with the latter, there's true backup as well. That said, Internxt segments its services in a very intuitive way, and what does distinguish it from the crowd are its incredibly affordable lifetime plans. Internxt is a relatively new venture, so you might want to hop on these deals right now before they come to their senses.

SIGN-UP AND PLANS

I've never seen an easier sign-up than the one for Internxt. Provide your email and enter a password a single time, and you're online with two sync folders (Family, Personal) ready to go. There's an email verification to remove the yellow exclamation point next to your account level, but that's it.

IMAGE: INTERNXT

I first tried the free plan, which starts at 2GB (but it said I had 3GB). The free plan can reach as high as 10GB through various actions such as inviting friends to the service. If you need more than that, there's a $0.89-per-month 20GB plan, a $3.49-per-month 200GB plan, and a $8.99-per-month 2TB plan. Those prices are approximate and subject to change as they reflect conversion to dollars from euros.

Those rates should drive home the idea that Internxt is competitive pricewise on a monthly basis. At first I was wishing for a 1TB plan, similar to the $70 yearly I pay for OneDrive. Then I discovered Internxt's lifetime plans, as shown below. Yowser!!!

If you've priced out online storage, these are eye-popping numbers. As mentioned, the 2TB forever plan (assuming the company lasts) is only a bit more per gigabyte than I pay for 1TB with OneDrive…for just one year.

As for the company lasting, while I hate to be that guy, my job description requires that I point out that Internxt is only three years old and online storage is a very competitive landscape.

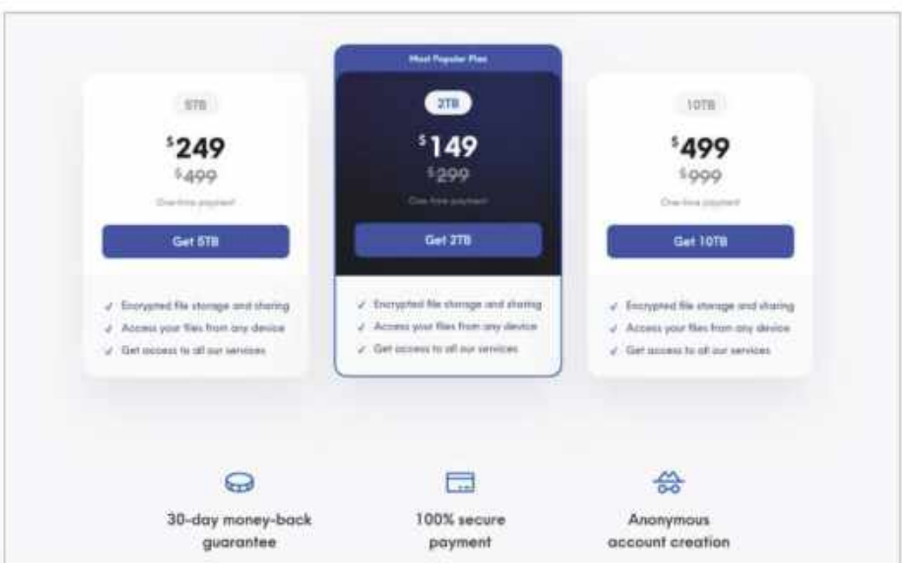
That said, the company employs the well-known OVH storage infrastructure (fave.co/3o1lsc5), so worst case, your data should still be available, and the lifetime pricing is more than worth a roll of the dice in my book. If you knew my tendency toward being risk-averse, you might be inclined to treat that as gospel.

Note that all of Internxt's plans, regardless of cost, offer exactly the same features, so no matter how much coin you're willing to part with, you get the full feature set. Kudos to Internxt there. Most companies use features to incentivize stepping up tiers.

SETUP AND USAGE

The layout and overall structure of the website make it very easy to set up and use Internxt via a web browser—as easy as or easier than any I've experienced. It's got a clean look as well.

One minor gripe is that it was difficult to find the help (fave.co/3o9orQJ). I actually gave up perusing the site (after not too long)



Internxt's lifetime plans are currently an incredible bargain—arguably even at a full boat.

and did a web search to find it, only to eventually discover the Support menu item on the local app.

Setup for the sync folder wasn't quite as breezy. Downloading the local app is easy enough, but the splash screens could provide a bit more info on where the sync folder is created and what it's named (Internxt).

Open the app after it's installed, and there's an icon to take you to the sync folder. That said, I found the location needlessly arcane. Fortunately, you can change it to a more prominent area such as the desktop, where you can access it without the app.

One macOS bug: When I added the folder "1. Midi files" the folder showed up in the list as "1" and wouldn't back up for obvious reasons. You can be careful with your naming, but Internxt should and probably will fix this. Another mild gripe—the entire path to the sync folder is not shown in the app, only its parent folder.

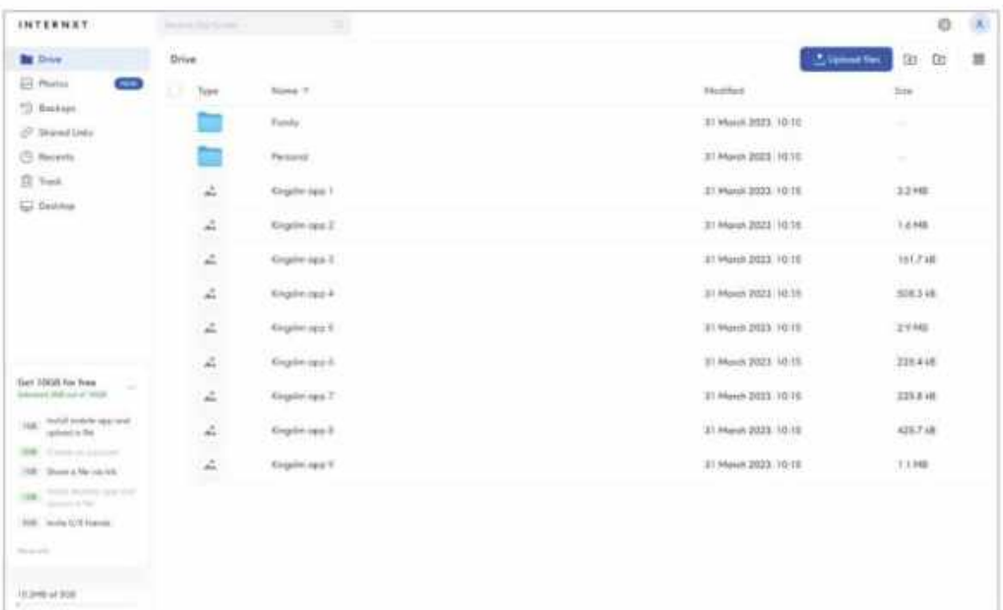
Glitches aside, none of Internxt is rocket science. A couple or 20 minutes with it should be all you need. Hint: A lot of stuff is hidden in the local app's preferences dialog.

INTERNXT DRIVE FEATURES

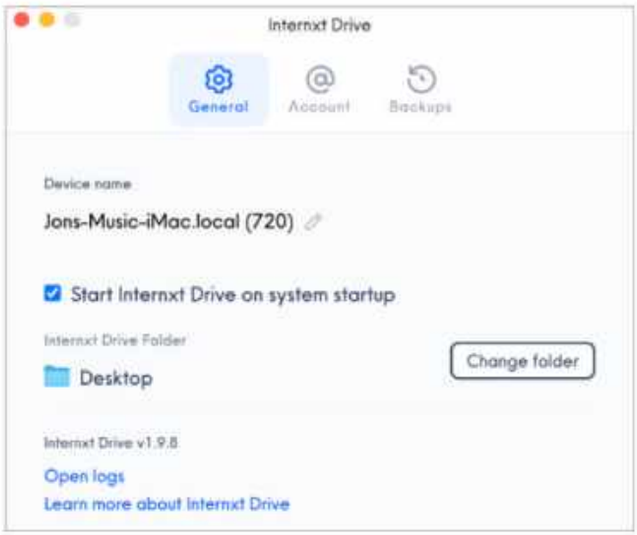
Internxt's features are basically fourfold: sync, backup, photo backup, and sharing. These are all located in different areas of the onscreen interface that you access via a menu tree to the left.

Syncing (to the Drive folder online) works as with most services: You drag or add files to the Internxt folder and they're synced between the devices you have Internxt installed on. There are apps for iOS and Android.

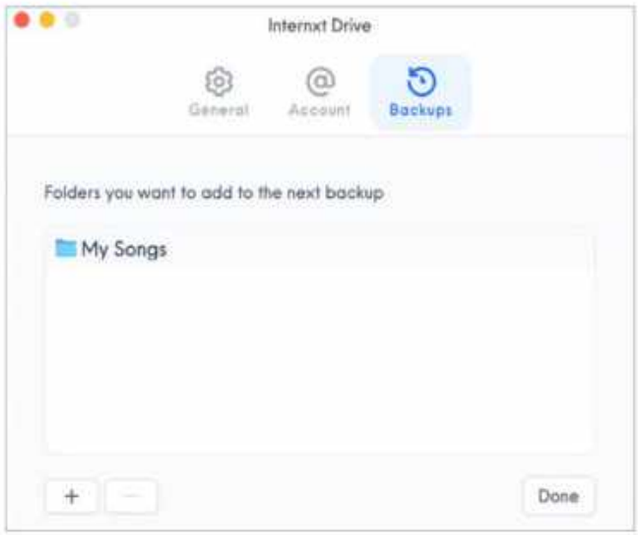
Backup should never be confused with sync, which is normally a two-way operation where any changes made on any device are duplicated on the other devices. Backups are



The Internxt website is easy to decipher and browse. It has a clean, intuitive layout.



You can change the location of the Sync folder using the preferences dialog. That's a good thing as you're not really told the default location.



You can add multiple folders to the backup list and they will then be copied to the online storage Backups section. These are true backups and separate from syncing of files across devices.

copied from one device to the cloud and are only altered remotely when files change on the originating device.

You may schedule backups for every 6 hours, 12 hours, or once a day. Newer files overwrite older ones, which Internxt confirmed—that is, there's no versioning. If you're looking for that—and it can be handy in certain situations—look elsewhere. I've never needed it, and for most users, current-state backup will be fine.

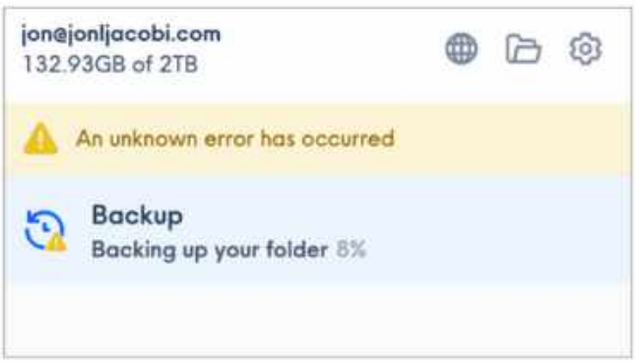
Photo backup simply backs up the photos on your phone, as do Google Drive and iCloud (when enabled). These are not synced but, as with backups, simply copied to the photos folder.

There's also a separate section where shared files are kept—that is, files shared with others, not among the Internxt sections. The separation reduces user confusion, even if it might waste a bit of space due to duplication.

PERFORMANCE

Sync was generally fine performancewise, though I didn't go much beyond 1GB of files. One issue I did notice was that when I deleted the files online, they repopulated online from the local folders rather than being deleted from local folders. I had expected the changes to be logged and reflected on other devices. I can understand this, but it's not complete two-way sync.

While both my 50GB and 400GB backups eventually completed, it wasn't without travail. Both quit intermittently due to connection errors. A couple were caused by my failure to turn off Windows sleep, but others were listed as "can't contact server"



The question is, 8% of how much—the entire backup or what's left? Also, the error message wasn't current but was a previous event.

errors with a live connection. The backups resumed automatically, but the interruptions were a bit puzzling.

Another mild issue is the "An unknown error has occurred" message seen in the screen capture below. This could give one the impression that the backup isn't transpiring when it actually is. Far less disturbing would be something like "Click here to see the error log."

Speaking of logs, Internxt keeps them and provides a link, but they contain every operation. There should be a separate log for errors so you don't have to search through 10MB of text to find them.

One thing Internxt should also implement is bandwidth throttling. Backups came too close to maxing out the upstream traffic for my taste, slowing or creating issues for other tasks on occasion. The backup function could also use better feedback. Knowing I'm 8 percent through a backup of unstated size (see above) is relatively useless. To be fair, Internxt is not alone in this.

One thing I did like was being warned about zero-byte files. It turns out my DAW (Ableton Live) creates lots of these. Or perhaps they were damaged in copying—I don't know which.

Success is always the bottom line, so good on ya, Internxt. But please make the process a bit less paranoia-inducing for those who've seen too many backups fail.

BOTTOM LINE

I find Internxt exceptionally easy to understand and use simply because it segregates tasks the way our minds do. The fact that the lifetime plans are currently a flat-out steal for the user doesn't hurt my opinion either.

The hand-holding could be better, as well as the feedback during jobs, but geez Louise, Internxt can save you a ton of money.

Internxt Drive

★★★★½

PROS

- Online storage, sync, and backup.
- Fantastically affordable lifetime plans.
- Extremely secure and private.
- Free 2TB account.

CONS

- Could use better help and task feedback.
- Occasional connection errors.

BOTTOM LINE

Internxt's intuitively blended web access, file sync, and true backup services are impressive. However, the incredibly affordable lifetime plans are currently the most outstanding feature. The docs and backup feedback could be better, but by Grabthar's hammer—what a savings!

Subscription service

Dell Ultrasharp U3224KB: A pixel-packed rival to Apple's Pro Display

This monitor packs in the pixels (and the extras), but it's pricey. **BY MATTHEW S. SMITH**

Want a 6K monitor? If so, Apple's Pro Display XDR is the only game in town—and its Mac-centric design makes it unappealing to those using Windows. Dell has finally delivered an alternative, the Ultrasharp U3224KB, which packs 6K resolution as well as a webcam, microphone, soundbar, and USB-C hub. The monitor's sharpness is spectacular but comes at a high price.

SPECS

The standout specification is obviously the monitor's 6144×3456 panel. This is a tad higher than Apple's Pro Display XDR, which

IMAGE: DELL

has a resolution of 6016×3384. Dell also opts for an IPS Black panel, a new type of IPS display panel that delivers a better contrast ratio than its predecessors.

The Dell Ultrasharp U3224KB has a solid build made from sturdy silver plastic.

Display size: 32-inch 16:9 widescreen
Native resolution: 6144×3456
Panel type: IPS Black LCD
Refresh rate: 60Hz
Adaptive-Sync: None
HDR: VESA DisplayHDR 600
Ports: 1× HDMI 2.1, 1x Mini-DisplayPort, 1× Thunderbolt 4/USB-C with 140 watts Power Delivery and DisplayPort Alternate Mode, 2.5Gb ethernet, 1× Thunderbolt 4/USB-C, 1× USB-C with 10 watts Power Delivery, 1× USB-A
VESA mount: Yes
Webcam: 4K HDR
Microphone: Included
Speakers: Included
Price: $3,199.99

The Dell Ultrasharp U3224KB retails at $3,199.99. That's an extremely high price, though certainly not unheard of—and with no other 6K option on the market aside from Apple's $5,000 Pro Display XDR, Dell likely feels free to charge what it wants.

DESIGN

Dell's Ultrasharp U3224KB has a 6K display, but odds are that's not what you'll first notice. The monitor throws in a soundbar and 4K webcam, both of which are positioned above the display. It's an odd, top-heavy look that immediately stands out, but it works just as well as if the soundbar was beneath the display.

Material quality is solid with sturdy silver plastics that resist flex and provide a convincing faux-metallic look. I do have a nit to pick, however: I found that the plastics in the monitor's bottom left and right corner were too flexible and creaked when the monitor was handled in this area. I doubt it's a functional issue but it's unfortunate to see at this price point.

A heavy stand keeps the monitor firmly planted on a desk. The base is compact, however, and its flat profile helps you retain some use of the desk surface that it does

occupy. This is preferable to high-end monitors that use wide, tripod-style stands, which are most commonly found on LG and Samsung displays. The stand adjusts for height, tilt, swivel, and can pivot 90 degrees into landscape orientation. A 100×100mm VESA mount is included for attaching a third-party monitor stand or arm.

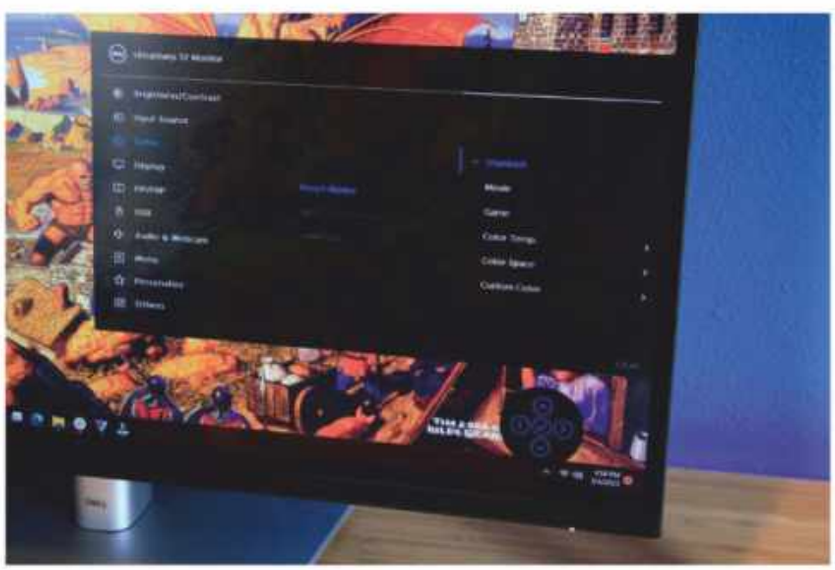
FEATURES AND MENUS

The Dell Ultrasharp U3224KB has a Thunderbolt 4/USB-C port with DisplayPort Alternate Mode and a whopping 140 watts of Power Delivery. That's important, as 140 watts is enough to fully power a new Dell XPS 15 (see page 29) (and many other premium laptops with midrange discrete graphics).

This port also acts as a hub that drives a USB-C downstream port, four USB-A ports, and a 2.5Gb ethernet port. This makes the U3224KB a capable USB hub (fave.co/3McDDEK). Do note, however, that the monitor lacks a USB-B upstream port, which means its USB hub capabilities are only available when the USB-C port is connected.

Additional video connectivity is available over HDMI 2.1 and, strangely, Mini-DisplayPort 2.1. Full-size DisplayPort 2.1 is not available. A Dell representative told me the use of Mini-DisplayPort was due to early technical issues with VESA's development of a full-size DisplayPort 2.1 connection. Those issues were resolved, but Dell had already locked in its design, leaving the U3224KB with Mini-DisplayPort. Dell also notes that a compatible Mini-DisplayPort 2.1 output can be found on the latest AMD Pro graphics cards. In any case, this makes for a total of three video inputs, all three of which support 6K resolution at 60Hz. Be careful to check the display output standards used by your PC, as older video cards may lack support for an output that can handle 6K.

A joystick is used to control the monitor's on-screen menus. Dell's menus are logically arranged and provide a variety of image quality options including color temperature adjustment and up to six-axis custom color adjustment for hue, saturation, gain, and offset (in the Custom Color mode). The monitor also has presets



The Dell Ultrasharp U3224KB's on-screen menus.

for the sRGB, Rec.709, DCI-P3, and Display P3 color space.

The joystick is joined by a set of touch-sensitive controls on the lower-left bezel that can adjust the volume, mute the microphone, or deactivate the camera. They're normally invisible but light up when a finger or hand comes within about a half-inch of the lower-left bezel. I don't think most people will use them frequently, as controlling these functions in Windows is a quicker, easier option. Still, privacy-minded users might like the option to deactivate the webcam and microphone.

The 4K HDR webcam delivers good video quality. It's not a match for a "real" camera, to be sure, but comparable to the quality of 4K standalone webcams like the Logitech Brio and Dell Ultrasharp Webcam (fave.co/3L6APqn). Video is fairly crisp and provides a lush, saturated look. A built-in microphone can capture audio and picks up strong, clear audio that easily beats most laptop or monitor microphones I've heard over the past few years. Together, the camera and microphone will help you look and sound your best in video calls.

The Dell Ultrasharp U3224KB comes with a built-in 4K webcam.

Audio quality is respectable, though not amazing. Volume is high and the presentation is crisp when playing less demanding content, like a well-recorded podcast, but the sound muddies in music, movies, and games. Still, it's a big step up from the dinky speakers found in most monitors. The microphone and soundbar have an echo cancellation feature that lets owners attend a video call without headphones.

SDR IMAGE QUALITY

The Dell Ultrasharp U3224KB is promoted as the world's first 6K monitor with an IPS Black display panel. So are the extra pixels noticeable?

Yes, they are. The 32-inch 6K (6144×3456) panel packs 220 pixels per inch, a roughly 60 percent improvement over a 32-inch 4K monitor. This pixel density is similar to that of Apple's MacBook Pro laptops and a bit less than a laptop with a 4K display. In fact, it might be more accurate to say the extra pixels aren't noticeable—because it's nearly impossible to see the individual pixels on the display. They only reveal themselves in test images or

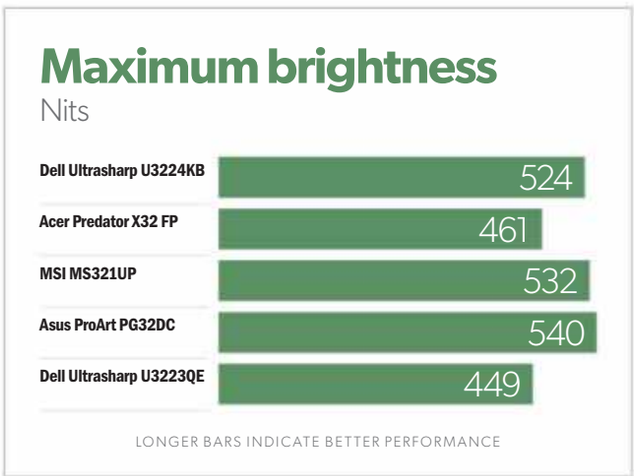
under magnification.

Whether you'll benefit from the pixel count is another matter. Most modern apps look great at 6K resolution, but older apps that lack proper scaling are extremely difficult to use without turning on WIndows' built-in magnification feature, which is cumbersome. Games look fantastic, but running a game at 6K resolution reduces its performance, so this won't be viable on anything but the latest GPU hardware (fave.co/3O1pryL). 4K movies and streaming shows look great but, of course, no more so than on a 4K monitor.

The full benefits of 6K are mostly reserved to content creators. It's obviously preferable if you shoot video at 6K resolution, or something close to it. Alternatively, you can edit video at 4K resolution and view a true 4K preview that takes up only a portion of the display. Photographers benefit, too, as the improved resolution makes it possible to edit large photos with less need to zoom in and out of the image.

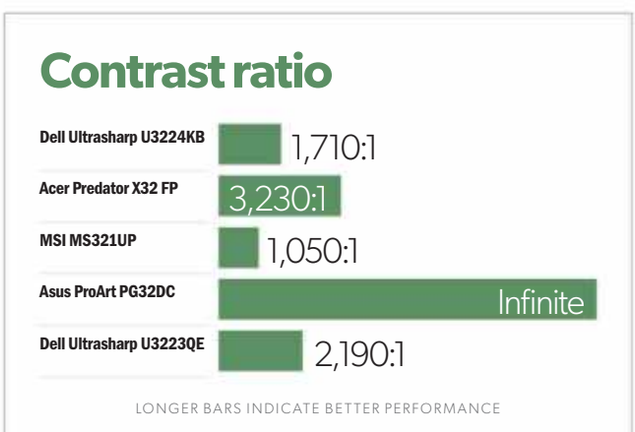
In short: 6K resolution looks awesome, but you'll struggle to fully appreciate it unless you're working with content at extremely high resolutions. This isn't a problem but an observation, and one that should help you decide if a 6K monitor is for you. We live in a 4K world, so you're unlikely to see the benefits of 6K content unless you're creating it yourself.

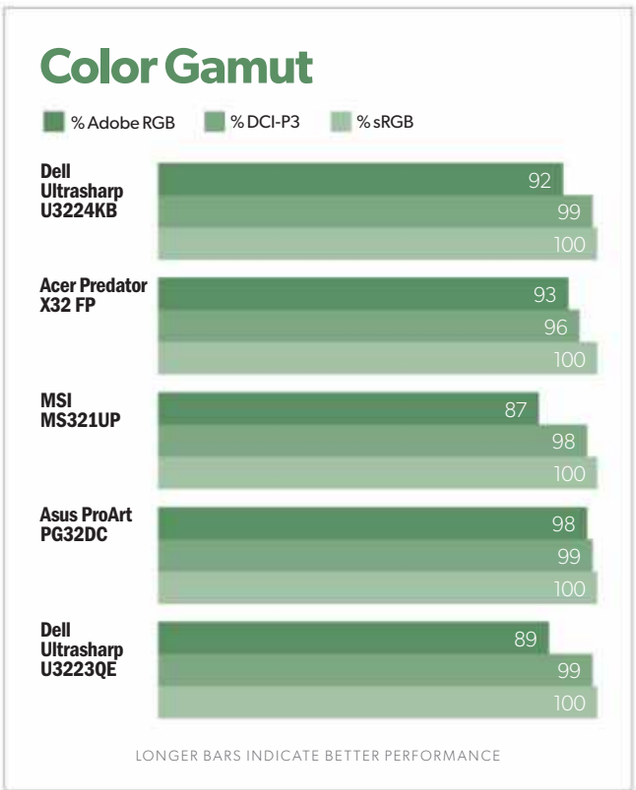
There is more to a monitor than just its resolution, however—and the Dell U3224KB scores well in most tests of image quality.



Maximum brightness comes in at an excellent 524 nits. That's much brighter than most situations call for (I spent most of my testing with the monitor set to 15 percent of maximum). However, I do think the brightness is useful, as this is precisely the type of monitor that might be mounted in a conference room or an executive's corner office. The monitor remains comfortable to use in a bright room.

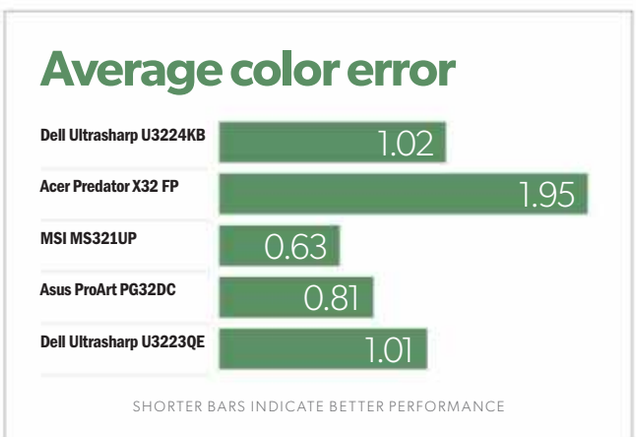
Dell opts for an IPS Black display panel. True to its name, it achieves a luminance as low as 0.01 nits. That's a big improvement





over a typical IPS panel, which can dip only as low as 0.06 to 0.03 nits (without a Mini-LED backlight).

The result is a respectable maximum contrast ratio of 1,710:1. It's a very noticeable improvement over a standard IPS display, yet still quite far behind Mini-LED monitors, like the Acer Predator X32 FP (fave.co/42lfxc4), and OLED monitors, like the Asus ProArt PG32DC (fave.co/3Ws4fVF). The Dell Ultrasharp U3224KB provides good depth when used in a bright room but struggles with shadow detail in darker scenes, and it can't hope to match the jet-black look of an OLED display panel.



This is a key point. The Dell's contrast ratio is behind similarly priced alternatives, but those alternatives don't offer 6K resolution. Shoppers will need to make a choice between sharpness and depth.

The Dell U322KB produced a color gamut that spans 100 percent of sRGB, 99 percent of DCI-P3, and 92 percent of AdobeRGB. That's an excellent result and beats most similar monitors. Only the Asus ProArt PG32DC, which has a top-quality 4K OLED display panel, exceeds the Dell U3224KB—and it's still a close call. The Dell should offer a broad enough color gamut to handle any task.

Color accuracy is solid, too. The Dell U3224KB does fall behind some alternatives, like the ProArt PG32DC, but the level of color error produced by these displays is so small that it's unlikely to be a problem for even the most discerning users.

I also recorded a gamma curve of 2.2, which is precisely on target, and a default color temperature of 6800K, which is just a tad cooler than the target of 6500K. These are good results.

Understanding the U3224KB's image

quality might feel complex. Simply put, the monitor looks great, but it only beats 4K competitors when 6K content is available.

HDR IMAGE QUALITY

The Dell Ultrasharp U3224KB supports HDR and carries a VESA DisplayHDR 600 certification. It performed as promised with a maximum sustained full-screen HDR brightness of up to 669 nits. That's a strong result that exceeds OLED monitors. However, it does fall behind Mini-LED monitors like the Acer Predator X32 FP, which can hit at least 946 nits.

High brightness helps the U3224KB provide a more vivid image and add luminance detail in HDR content. Bright highlights, like a sunset or headlights in a dark alley, are noticeably more detailed than in SDR. However, the U3224KB's modest contrast ratio is a limitation and ultimately dulls the monitor's impact in HDR. The monitor struggles when a small, bright object appears in an otherwise darker image, looking flat and washed-out compared to a Mini-LED or OLED alternative.

The U3224KB also falls well behind other monitors in its price range. It's only a few hundred dollars less expensive than the Asus ProArt PG32DC, an OLED monitor that's barely dimmer in HDR content and delivers a far more realistic image in dark scenes. The Acer Predator XP32 FP, which retails for $1,500, demolishes the U3224KB's HDR performance with higher marks in both bright and contrast. The Dell looks decent on its own, but it's hopelessly outmatched by price-competitive alternatives.

MOTION PERFORMANCE

Motion performance isn't a focus for Dell's Ultrasharp U3224KB, and it shows. The monitor has a 60Hz refresh rate and promises a minimum gray-to-gray response time of five milliseconds. Neither figure is great: Today's best monitors reach up to 500Hz and achieve sub-millisecond gray-to-gray response times.

Fast-moving objects show little clarity as they zoom across the screen. The vague outline of the object is tangible, but details,

Motion clarity is not a focus for the Dell Ultrasharp U3224KB, which comes with just a 60Hz refresh rate.

This is an exceptional monitor.

like the color of a person's eyes or the texture of their clothing, are indistinct. Panning the camera in a 3D game will cause significant blur that makes it difficult to focus on any particular object, character, or enemy. While the U3224KB's overall performance is not impressive, it's typical for a 60Hz monitor.

Adaptive Sync is missing as well, so the monitor can't coordinate its refresh rate with the video output from a device. This will cause screen tearing and/or micro-stutter issues in some games.

BOTTOM LINE

The Dell Ultrasharp U3224KB is an exceptional monitor with a razor-sharp 6K image, useful webcam and microphone, and versatile USB hub, but its overall image quality and feature set may not hold up against 4K alternatives. Despite its impressive resolution, the U3224KB's contrast ratio and HDR performance fall behind those of similarly priced options like the Asus ProArt PG32DC.

Still, a simple fact remains: The Dell Ultrasharp U3224KB is a 6K monitor. Apple's Pro Display XDR also provides 6K resolution but its price, design, and focus on the Mac make it a nonstarter for those on Windows PCs. Creators on Windows who want 6K resolution will find the U3224KB is their only option. For now, at least.

Acer Predator CG48

★★★½☆

PROS

- Wonderfully crisp 6K resolution.
- Quality integrated webcam, microphone, and soundbar.
- Versatile USB-C hub with 140 watts power delivery.

CONS

- Medicore contrast ratio for the price.
- HDR performance is merely adequate.
- Benefits of 6K won't be noticeable with most movies and games.

BOTTOM LINE

The Dell Ultrasharp U3224KB delivers a 6K panel that will appeal to some professionals, but its high price tag and mediocre contrast performance will limit its appeal.

$3,199

G.Skill KM250 keyboard: Gold standard for the bargain bin

Who knew you could fit so many features in a keyboard for just a little more than 50 bucks?

BY MICHAEL CRIDER

PCWorld EDITORS' CHOICE

If you've been following my keyboard reviews lately, you know I've been lamenting the ever-increasing price of mainstream "gaming" boards that don't seem to be in any way related to their actual function. I was looking around for good budget alternatives (fave.co/3MBJpB3) when all of a sudden G.Skill released a new mechanical keyboard, priced at just $55 on Amazon. How incredibly fortuitous!

Of course, with a budget keyboard you give up certain luxuries like a rotary dial—oh, wait, the KM250 has one. Well, you can't expect to pay so little and also get decent keycaps…huh, *actually*, the KM250 has PBT "pudding" keycaps that complement the RGB lighting rather nicely. But of course, with a budget board you get budget mechanical switches from (checks spec list) Kailh? What? Well, there's no way that the board includes hot-swap switch sockets so you can swap

IMAGE: G.SKILL

You can change the KM250's keys if you want better ones.

them out for better ones…oh, wait, it does that too.

In fact, the G.Skill KM250 has a laundry list of features that are shocking to see on a board at this price range, omitting only a few that are fairly reasonable. As such, it gets an easy recommendation for anyone looking for a high-quality, entry-level board, especially if you think you might want to invest in some upgraded switches or keycaps.

SPECS

The KM250 is a fairly standard wired mechanical keyboard in the increasingly popular, and somewhat nebulous, "65%" form factor. That means all of your primary typing keys and an arrow cluster, the absence of a function row, and a few more keys rounding it out: in this case, Delete, Page Up, and Page Down, plus a rotary dial.

That dial has become a mainstay of premium keyboards—if you don't have at least one dial, don't even bother coming to the meetup—so it's impressive and welcome to see it on this budget build. Though it's as plastic as the rest of the board, it does include a "click" button when you press down, so it's perfect for the standard volume plus mute functionality.

Elsewhere you get a functional, if chunky, case with double-sectioned feet for three typing angles, a 6-foot detachable braided USB-C cable, and a keycap and switch puller in the box. The keycaps are high-quality PBT, which some other companies make you pay

It's impressive to see a dial on a budget model.

The "pudding" style keys mean the RGB lighting shines even brighter.

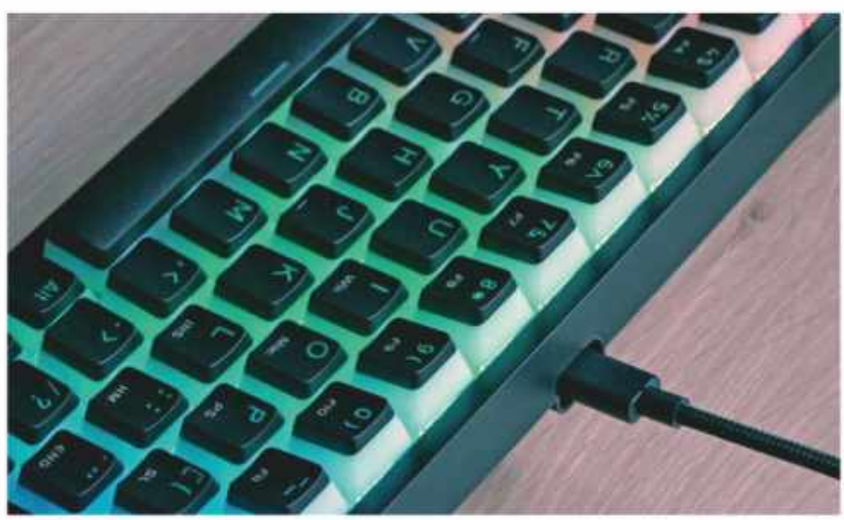
extra for (Razer, I'll stop calling you out for this [fave.co/3BwpnBu] when you stop doing it). The caps are of the somewhat niche but appealing "pudding" style—that is to say, solid black tops with translucent sides to make the RGB lighting shine even brighter. It's not up to the dazzling standard of the Roccat Vulkan (fave.co/3BAAFF1) series, but it's pretty nice nonetheless.

Underneath are linear Red switches for speedy, game-friendly key presses. As noted in the intro, the switches are from Kailh, a pretty huge supplier of switches both fancy (like the "Blueberry Ice Cream Pro" ones in the Keydous NJ80-AP, fave.co/3pL3cVH) and basic. These *are* basic Red switches, without any reinforced BOX stems or pre-lubed springs, but I appreciate that G.Skill *could* have gone with a cheaper brand and didn't.

And finally, the switches can be taken out of the plastic plate and replaced with any MX-compatible alternative. Again, this is a standard of more expensive boards that by rights shouldn't be in one this cheap—it wasn't in the Havit KB487L (fave.co/3MBJpB3), for example, and that board is only slightly cheaper. The KM250 is an absolute marvel of mechanical keyboard value.

PROGRAMMABILITY

G.Skill included pretty much everything in this board, unless you're looking for wireless



You'll need to plug this keyboard into your computer.

G.Skill offers 18 different animation options in various colors, for which you can adjust the speed and direction.

options or exotic construction. But there is one thing on the basic laundry list that isn't here: programmability. The KM250 is locked to the layout you get out of the box, including the function layer and lighting controls—the only download you'll see on the support page is a digital copy of the quick-start guide you get in the box.

Not that the guide is really necessary. The subfunctions of each key are printed on the keycaps, and are easy enough to figure out on their own. With no lighting programming options, you *do* get an admirable selection of light shows: 18 different animation options in various colors, for which you can adjust the speed and direction. I'm not really a fan of RGB, so I set it to the static rainbow and left it there. This is where I'd put a screenshot of the programming tool. But there isn't one. Sorry about that.

So yes, there's the KM250's one weakness, if it's fair to call it a weakness in a keyboard this cheap. That said, a lack of programmability doesn't really matter for the stated goal of PC gaming, since each game should allow you to rebind key controls. Otherwise it's down to OS-level tools, like my go-to, SharpKeys (fave.co/459bHdx).

TYPING AND GAMING

So the only thing left to ask is, is it a good keyboard to use? Plainly, yes. You don't get the fancy feel that comes from more premium parts—everything here is basically plastic. But it's about as good as mass-produced plastic can get, and very much in line with G.Skill's reputation for functional, low-priced hardware. (Love your RAM DIMMs, by the way!)

The KM250 works well as a full-time keyboard.

This board has sound-absorbing foam that keeps the spacebar from rattling.

I noticed that there's *also* sound-absorbing foam underneath the plastic plate, and even in the gap beneath the spacebar, preventing the distinctive "space rattle." *Man,* this board goes so much harder than it has to!

The KM250 works equally well as a full-time keyboard or as a secondary, more portable option, thanks to its lightweight build and full dedicated arrow cluster. If you want something to bring along to a LAN party (or perhaps more timely, just hanging out at your friend's place while you both play online), it'll do that, albeit not quite as stylishly as something low-profile like the Razer DeathStalker (fave.co/3WgZSho) or Keychron K series (fave.co/3plykoO).

And if you just want an inexpensive board to see what this mechanical craze is all about, it'll do that, too. Just for the hell of it, I took the excellent exotic switches from the Keydous NJ80 and my favorite "Galaxy Class" DSA keycaps. I wanted to simulate a bunch of money poured into this cheap board, and yes, a few premium parts go much farther on this board than on many others in its price range. For example, when

BOTTOM LINE

The KM250 is an astonishingly good value and gets an easy recommendation unless you simply *must* have the ability to program your keys and lighting. For everyone else it's an absolute steal, setting a new gold standard for super-cheap, super-functional mechanical boards.

G.Skill KM250

★★★★½

PROS

- Incredible value.
- PBT "pudding" caps.
- Great layout.

Hot-swap switch sockets.

CONS

- No programming options.

BOTTOM LINE

The G.Skill KM250 has a ton of features and incredible value—it's absolutely unbeatable at this price. The only thing it's missing is programming.

$55

Hands-on: The ROG Ally is a Steam Deck competitor with more power and options

Asus enters the new portable PC gaming fray, leaning on the power of Windows and add-on GPU hardware. **BY MICHAEL CRIDER**

You can run Windows on the Steam Deck. And you really, really shouldn't (fave.co/3oa7YM4). Valve's portable machine has singularly carved out a new hardware niche for PC gamers, but it did so with a system built around the Linux-based SteamOS from the ground up. Such competitors that have arrived in the last year come from smaller companies without the resources to either sell games or make software, and have thus had to settle for more expensive machines with roughly the same specs, running Windows. And frankly, they don't measure up.

The Asus ROG Ally might just be the first competitor that can. It's a familiar form factor, with more power thanks to a brand-new AMD Z1 chip based on Zen 4. And it was made from day one with Windows gaming in mind, to the same degree that the Steam Deck was built around its operating system. And thanks to compatibility with the same proprietary external graphics cards as the ROG Flow laptops and tablets (fave.co/3ocvFU8), it

IMAGE: ASUS

might—*might*—be able to fully replace a gaming laptop or desktop. Hell, it might just be able to replace a full desktop PC, period.

Will that extra capability be worth the inevitably higher price of the ROG Ally versus the Steam Deck, especially since the ROG XG Mobile eGPU is another thousand bucks (at least) on top of that? Who knows? But it's certainly shaping up to be an interesting alternative for those who demand more power and options.

The ROG Ally might just be the first Steam Deck competitor that can measure up.

HOW DOES THE ROG ALLY FEEL TO PLAY?

Picking up the Ally reminded me of a larger, more angular Nintendo Switch. That's probably not surprising—that's what the thing *looks* like, after all. But what shocked me is that it's also about as light. Seeing this incredibly compact hunk of plastic and electronics, ostensibly with full PC power, you'd assume it would feel heavy in your hands like an oversize smartphone. Not so! While it's large and only pocketable if you're still rocking vintage JNCOs, it should be light enough to toss it in almost any bag and forget it's there. I didn't have a kitchen scale handy, but specs say that it's a little over half a kilogram (1.34 pounds). That's a bit heavier than an iPad, but it feels lighter thanks to those comfy grips.

And the Ally is comfy, for lack of a more precise word. Though the slanted lines and angled plastic make it look "sharper" than the curvy Steam Deck, this is deceptive. The gadget is rounded in all the right places, and your hands don't touch any of the angular bits while in play. I can see this thing going for

The Ally also has RGB lighting, with rings around both thumbsticks.

hours of gaming sessions…or at least one to two hours, when your battery will need a recharge. During our brief demonstration time, the Ally managed to stay cool even while playing *Ghostrunner* and *Forza*, a testament to its dual interior fans, which were hard to hear spin up.

The other big difference versus the Steam Deck is the screen. The Deck's 7-inch, 800p screen maxes out at 400 nits, which is fine for what it is—again, about the same as the original Nintendo Switch. But the Ally beats it in almost every way. It's the same size, but with full 1080p resolution, 500 nits of brightness, and a doubled 120Hz refresh rate, making it match a midrange gaming monitor. At 7ms of response time, it's not incredibly quick, but standard FreeSync compatibility, which most gaming laptops have (and the Steam Deck's internal screen does not) should help fix that. Asus was also quick to point out that it has a smartphone-style Gorilla Glass Victus cover with a Corning DXC coating for better visibility in sunlight.

The big omission? Touchpads—an iconic part of Valve's hardware design since the original Steam controller. Asus opted to go for larger, Dolby Atmos–compatible front-facing speakers instead. That might limit your options with less controller-friendly Windows games on the go. The Ally also has RGB lighting, if you really must show off this eye-catching design even more, with rings around both thumbsticks and a small bar on the back. I'll note that some gamers, particularly fighter fans, might take issue with the Genesis-style circular D-pad.

SPECS

What about the insides of this thing? Asus has teamed up with AMD to make the Ally the debut device for the Ryzen Z1 series of processors, designed specifically for mobile PC gaming form factors like this one. With 4-nanometer Zen 4 architecture and an

This is an amazingly powerful system.

RDNA 3 graphics core, it's using at least some of the same silicon as the absolute cutting edge of Ryzen laptops (fave.co/3pUA8Lu). Combined with the dual fan system and liquid cooling "anti-gravity heat pipes," it should be a shockingly powerful little system.

How powerful? Honestly, we don't know. More technical information and benchmarks weren't made available, and Asus didn't say precisely what GPU powers this new model of APU is rocking. It's certainly more powerful than the Steam Deck and most of its competitors that have arrived in the last year, all based on Zen 2. But playing some of the latest PC games on this thing, in full Windows 11, didn't seem to give it any trouble at all. (Update: AMD posted a series of benchmarks for the new Ryzen Z1 processors; see fave.co/3OmXqE6.)

When it's plugged into one of the XG docks, it's hard to tell you're not using a desktop gaming PC.

Other notable aspects of its Windows-powered hardware include a maximum of 16GB DDR5 RAM (lower capacities may or may not be sold, we don't know yet), a maximum of 512GB of M.2 2230 PCIe gen 4 storage (ditto), a MicroSD card slot with UHS-II speed for expansion, Wi-Fi 6E, and a smartphone-style fingerprint sensor in the power button, the better to log into Windows sans keyboard. All the expansion ports are on the top edge, including USB-C, dedicated headphone jack, and that proprietary port for the mobile dock.

EVEN MORE POWER, IF YOU PAY FOR IT

Let's talk about that mobile dock for a moment. The ROG Ally is perfectly happy to plug into a monitor or TV with a standard USB-C hub, à la the Steam Deck or Switch, and play games off its own internal power. But one of its key differentiators is the ability to plug into an ROG XG external GPU. Asus has been making these laptop-GPUs-in-a-box for its Flow series for going on three years, allowing them to be ultraportable machines that can plug into hefty, power-hungry graphics when they need to.

The Ally pulls the same trick. And when it's plugged into one of the XG docks, it's hard to tell you're not using a full desktop gaming PC. Asus had a demonstration running at the event, playing Ghostrunner at 4K resolution on a 27-inch monitor, and it was buttery smooth for that blink-and-you're-dead combat game. That was with the RTX 4090 version of the dock, mind you, and the little plastic hunk was basically a space heater as it drove video on the monitor and the Ally at the same time. The mobile docks also include wired Ethernet plus plenty of spare USB ports for your gaming gear and an extra USB-C Gen2 Type C.

This is, frankly, super freakin' cool. Yes, the Ally could replace a full desktop, assuming you're willing to put that extra money in. And it's quite a bit of money: Asus is selling last year's model with a Radeon RX 6850 XT card for $1,000 (fave.co/41HyrhO), while the 2023 RTX 4090 version at the demo event goes for two grand (fave.co/42OjVGg). That $2,000, plus whatever you spend on the Ally itself, can buy a whole lot of gaming desktop or a pretty great gaming laptop. And, unlike other eGPU docks (fave.co/3MCD889), these are mobile graphics cards that cannot be upgraded independent of the PCIe-based chassis.

That's a lot of capability and a lot of money. Frankly, I'd be tempted to spend $1500 on a midrange gaming PC and buy an Ally at the same time, assuming I had the disposable income for both. But this sort of whiz-bang tech always comes at a premium, at least at launch.

When the Ally is plugged into one of the XG docks, it's hard to tell you're not using a gaming PC.

WINDOWS GAMING, OUTDOORS

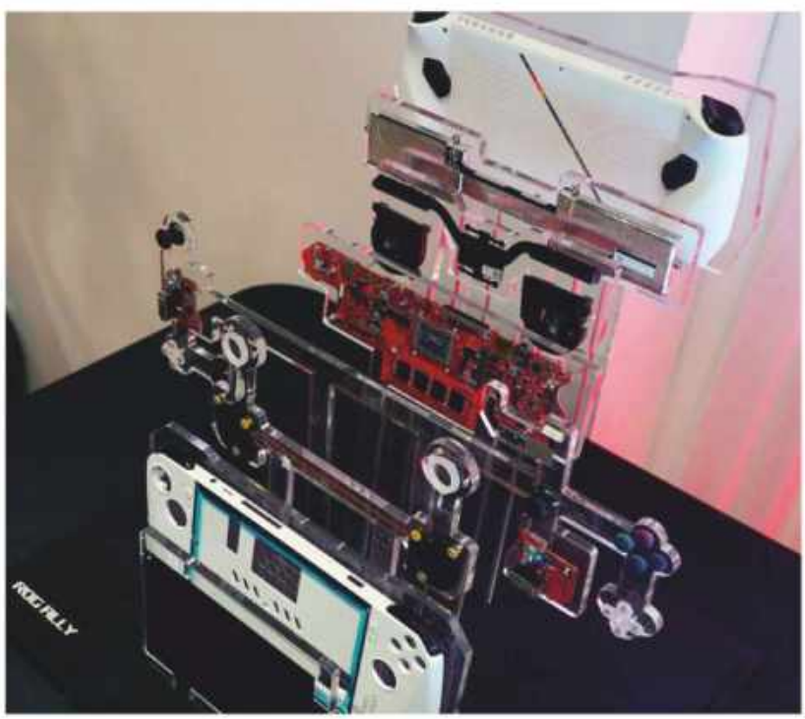
The technical capabilities of the Ally + XG dock are undeniable, and even without those, it makes for a pretty solid desktop machine when you plug in a monitor, keyboard, mouse, and speakers. (Yeah, that's a lot of hardware to add on, now that I list it.) And you can get all that capability with Windows 11 installed out of the box. I'm less convinced of the Ally's ability to easily navigate Windows on the go, with its lack of touchpads and its reliance on a touchscreen keyboard.

All the expansion ports are on the top edge, including USB-C, a dedicated headphone jack, and that proprietary port for the mobile dock.

Of course Windows, and the nigh-unlimited games it offers across all PC-based game stores, is another one of the big draws for the Ally. "Every Game, Every Platform, All at Once" is the trendy Oscar-style tagline Asus goes with, since the gadget won't rely on Linux releases or an emulation layer (fave.co/3I79xPR). That also means some of the games that still stubbornly refuse to run on the Steam Deck—like *Fortnite*, for example—can be confidently played without a "Certified" label.

And speaking of non-Steam games, the included Armoury Crate SE app is the latest in a long line to claim to unify all your disparate gaming libraries. In my brief time with it, I found it finicky and disjointed. In addition to providing yet another interface for launching games, it's also where you adjust settings like the Ally's trigger sensitivity, lighting effects, et cetera. Frankly, I'd rather connect a full mouse and keyboard and just add external games to Steam's Big Picture Mode (fave.co/3MHHL1c), which should work just as well on the Ally's Windows hardware as it does elsewhere.

Keep in mind that you're unlikely to go for any superlong gaming sessions on the road. An Asus representative told me that in testing they managed to get an average of about 90 minutes of game time, maybe 2 hours if they turned down the visual settings. The Ally can go further, if you opt for



An exploded view of the ROG Ally.

streaming games via Game Pass or GeForce Now, but that also requires a rock-solid connection. Whatever you're playing, you'll want to pack a charger in the bag, especially if you're on a long-haul flight or cross-country bus or car ride. That's about the same as the Steam Deck and its contemporaries. But battery life remains an Achilles heel of this form factor and doesn't seem likely to get better any time soon.

PRICE

The Steam Deck starts at just $400, maxing out at $650 for the highest-end model with more storage and a slightly better screen. Popular wisdom says Valve is using old-fashioned game console loss leader tactics (fave.co/3OgWIlw), losing money on every Steam Deck sale and hoping to make it back on software sales.

With newer AMD Z1 hardware and an improvement in just about every measurable technical capacity, and without literally millions of gamers giving a cut on every game sale, there's absolutely no chance the ROG Ally will be anywhere close to the Steam Deck's entry-level price. The Windows license alone would make that basically impossible. The question then becomes, how much *more* will the Ally cost and will it be worth it in terms of the added capability and value?

Asus is pricing the ROG Ally at $599.99 for the standard version—which won't be available at launch—and $699.99 for the upgraded Z1 Extreme version. Considering that almost all of the Windows-based Steam Deck competitors have come in at over a thousand bucks so far, and the Ally is beating it in several key components, the price is competitive bordering on aggressive. Of course the Ally doesn't have the same end-to-end synergy of hardware and software that the Steam Deck does…but you could argue that with the flexibility of Windows and its nigh-infinite game selection, it doesn't need it.

The ROG Ally will be aggressively priced.

The Z1 Extreme version of the ROG Ally launches on June 13, with Best Buy (fave.co/4391202) as the exclusive U.S. retail partner. It's available now for preorder.

PROTECT YOUR LEGACY
PLAN FOR EMERGENCIES TODAY

VISIT READY.GOV/PLAN

MAKE

A family communications plan

SIGN UP

For local weather & emergency alerts

PREPARE

An emergency kit

IT'S TIME TO ROLL UP YOUR SLEEVES AND OPTIMIZE YOUR PC WITH SOME SPRING CLEANING.

BY MARK HACHMAN

IMAGE: RA2 STUDIO/SHUTTERSTOCK

13 FREE TIPS TO MAKE YOUR WINDOWS PC RUN FASTER

Summer is here and that means weeding, cleaning, packing away winter clothes…and tuning up your PC! Optimizing your PC's performance isn't as complicated as it sounds, however. Just a few tweaks here and there and you'll have your PC running faster than ever.

Improving your PC's efficiency can take a little effort, though some processes can be automated. Your PC is like a Roomba in that streamlining your laptop or desktop often happens when you're not looking. Below, we've listed several ways to improve the responsiveness and overall speed of your PC and to preserve its longevity, too. Some may be familiar, others not. And if you've already taken care of these, good for you!

After all, why buy a new PC if you don't have to?

1. APPLY WINDOWS UPDATES

Have you tried turning it off and on yet? The U.K.'s *The IT Crowd* made this a meme, and it's true. Rebooting can in fact make a wonky PC behave. From experience, though, PCs can also behave badly when an update is needed or downloaded but not yet installed.

Make sure your PC is up to date via Windows Update (open the Settings menu, then Windows Update, and click "check for updates"). Manage Windows updates (fave.co/3WaZXmG) to make them less of a pain. Apply updates to Google Chrome, Microsoft Edge (fave.co/3Bxr5TB), and other browsers

Making a few tweaks to your computer will give it a performance boost.

by checking them. The Microsoft Store app is the front door for applying updates to Windows apps like Mail or Calendar, though those will happen in the background. Make sure Windows Defender or any anti-malware apps you use are also current, though that should happen automatically.

One additional tip: go to Windows Update > Advanced options and toggle on the option for updating "other Microsoft products." That can actually trigger updates for products connected to your PC, like a Brother printer.

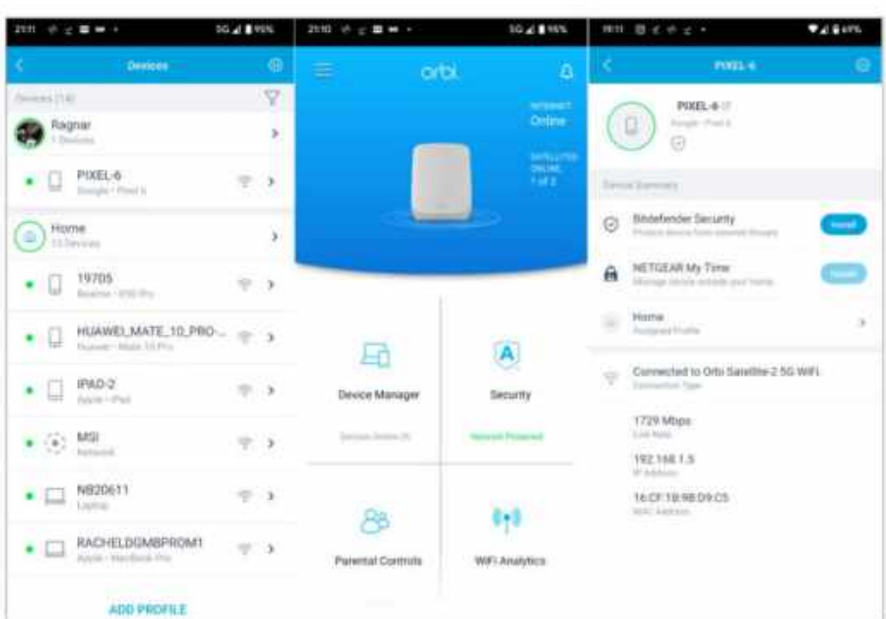
Applying the latest Windows update is a must, whether it be automatically or manually.

2. UPDATE YOUR ROUTER TO SECURE YOUR HOME

You need to make sure all of your software drivers are updated. Most of this happens automatically, though, as part of your day-to-day use.

A major exception is the software your router uses, which often requires accessing the router or the accompanying app. If you're having problems with your Wi-Fi (fave.co/3WzdEdZ), this can help.

Make this a habit. It's unlikely that your suburban neighbors are trying to hack your PC. In an urban apartment, however, there are likely numerous people within Wi-Fi range that come and go. Botnets love to hack Wi-Fi routers (fave.co/434Vvbu), too. Just play it



You don't even need a PC to manage a router's firmware any more.

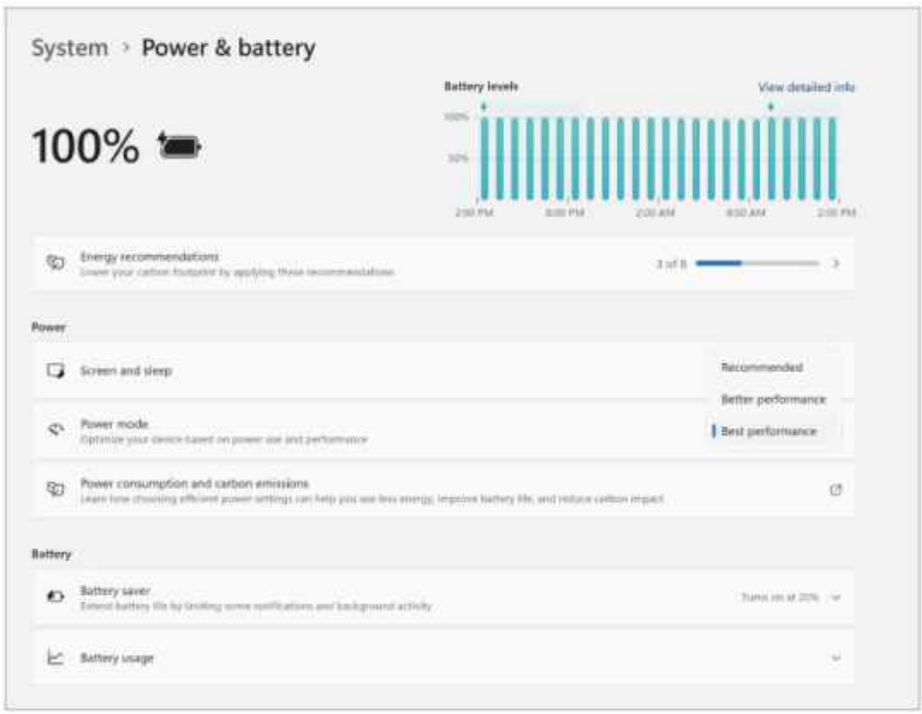
safe, open your router's app, and update the firmware.

It wouldn't be a bad time to update your password, either—passwords get easier to crack (fave.co/3hmwmqC) all the time. Forgot your router's password? It's really not the worst thing to just write it on the bottom of the device, especially if you live alone. (If someone breaks in, this is the least of your worries.) Otherwise, make sure you trust your roommates.

3. ADJUST YOUR PC'S PERFORMANCE SLIDER

It's an old trick but a simple one. Yes, your PC has a bona fide turbo button, and you can adjust it however you'd like.

There is a performance slider in both Windows 10 (fave.co/3B3FG6c) and Windows 11 (fave.co/3DOnyiE), which you can use to literally tell your PC to run faster. It may lower your laptop's battery life a bit if you're on the go. But either the Windows controls or any associated utilities that shipped with your GPU or gaming laptop can also be used to accomplish the same thing: Click a button, get a faster PC.

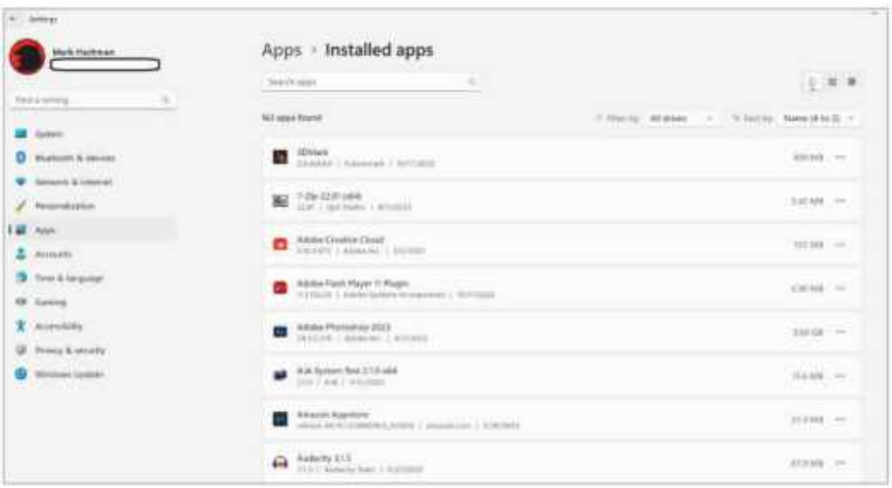


Windows literally allows you to dial up your PC's performance!

4. UNINSTALL OLD OR UNNECESSARY PROGRAMS

One of the benefits to owning a PC is trying out various applications and services. Sometimes, however, you'll discover that you might not need them any more, perhaps because they've become less useful. So, remove them!

First, view your installed apps. The easiest way to uninstall an app in Windows 11 (fave.co/45a7Z3h) is to go to your Start menu and review the list of applications. To uninstall a program, right-click the app. Alternatively, you can use the Windows Settings menu (Settings > Apps > Installed apps, or Apps & Features in Windows 10, fave.co/3Wcbxhm) and



Apps can take up just a few megabytes—or they can occupy gigabytes. Manage them in the Settings menu.

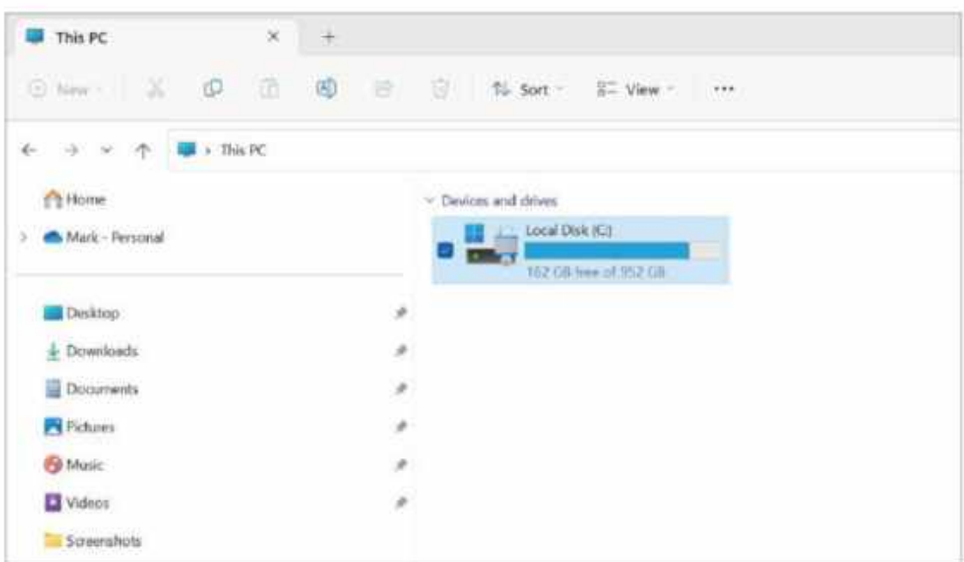
review which applications you have installed. To uninstall an app, simply click the ellipsis (…) menu to the right of the app. Windows will tell you how much disk space it takes up and how much you'll get back by uninstalling it.

That's not a perfect solution, though. In some cases, you may have Win32 apps installed—utilities or games, mainly. A game launcher like Steam will tell which games Steam installed on your PC, giving you the option to uninstall them. Alternatively, you can also use the old-school Control Panel for a list of installed apps. Go to Control Panel > Programs > Programs and Features, click the game, and uninstall it.

Which files should you uninstall? It's probably safe to say that if you're unsure about it, leave it. But if it's an app that you simply don't have any need for, get rid of it. Feel free to use a search engine to learn more about individual entries. And note the *size* of the program, too—eliminating the biggest ones make the most sense.

5. CHECK AND SEE IF YOUR HARD DRIVE OR SSD IS FULL

This is a simple tip but a useful one. Open up File Explorer and navigate to My PC. Check to see how full your primary boot disk is. If the



This PC's SSD is filling up, but there's still room left for now.

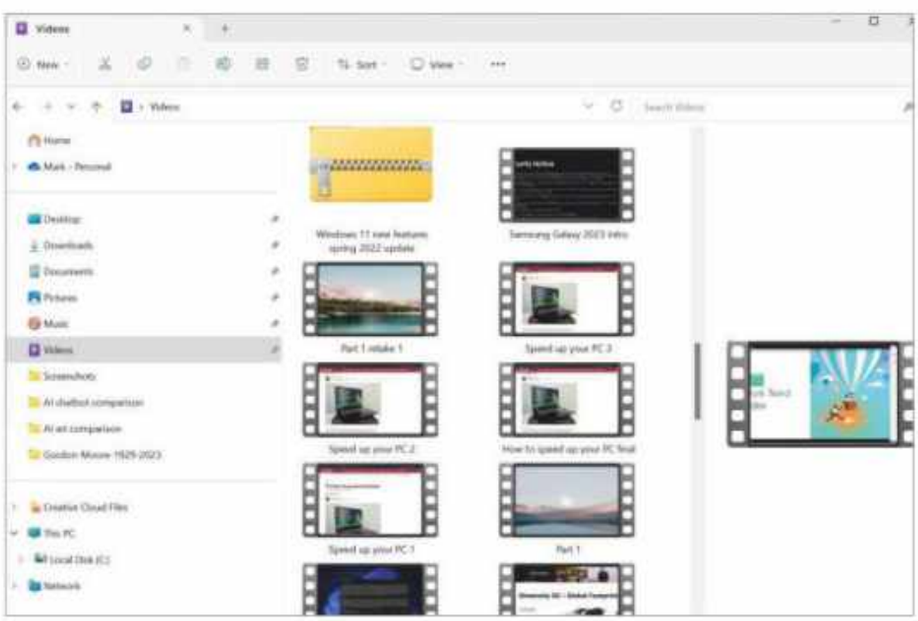
file gauge is in the red, you have about 10 to 15 percent of the drive remaining to store files. Not only will this prevent you from installing large games or video files, a clogged drive can also slow down your PC if there's not enough available space for use with background processes.

What you don't have to do is worry about defragging your hard drive or SSD. Windows handles all of that quietly and in the background.

6. ELIMINATE MASSIVE FILES BY BACKING UP, THEN DELETING THEM

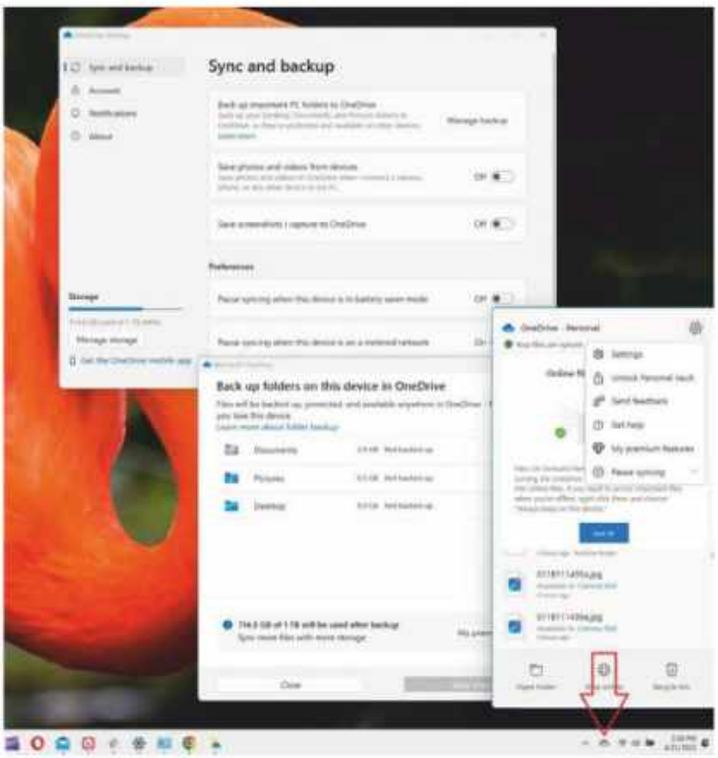
Generally speaking, the bulkiest files on your SSD or hard disk will be programs (generally games, which we hope we just cleaned up) as well as big files like video. You probably don't need to harken back to the days of the extensive file management utilities (fave.co/3MARTZp) we wrote about a decade ago, though apps like Space Sniffer (fave.co/3crnCcq) remain to find large, hidden files. Your best bet is to simply identify the largest video and/or music files and move them off of your PC. Here, you'll want to dig through File Explorer, specifically Your PC: Videos, Music, Documents, and Pictures.

If you'd like, you can back up files to a backup hard drive or the cloud via our Windows backup guide (fave.co/3EApUU6). (Or why not do both? Here are our recommendations for the best Windows backup software [fave.co/3nINb3Z] and the best external drives [fave.co/3n5NIMC] for doing so.) Alternatively, OneDrive is a solid choice for cloud backup, offering up to 1TB of cloud file storage via Microsoft 365. Other alternatives are OneDrive, Box, Dropbox, or Google Drive, all of which will allow you to create a dedicated backup folder within File Explorer for file backup.



Windows 11's File Explorer is your key to finding big files. You can also organize by size using the drop-down menu above.

OneDrive allows you to automatically back up files stored in Documents and the Pictures folder as well as your Desktop. Click the OneDrive icon on your



Windows has built-in backup capabilities that you can launch by clicking the OneDrive icon in the taskbar, but you have to manage them.

taskbar, then the Settings gear in the flyout menu to manage this.

It's not quite as simple as it should be, though. If you use your desktop as a place to store random files, you might want to turn off OneDrive's Desktop backup to save space. Apps like games or Adobe can also use your Documents folder to save games or backup files, which you might need backed up into the cloud.

In a case where OneDrive syncs a specific folder, cloud files (indicated by the small cloud icon next to it) are mixed in with local files. Personally, this makes me a little nervous—in a folder whose contents are backed up to the cloud, deleting the file erases it from your local drive as well as the cloud. (It then goes to the Recycle Bin, where it can be restored). To avoid this, you can use File Explorer's "Free up space" command by making local files cloud-only, deleting the local copy, and letting the file live online instead.

The bottom line is this: Root out big files, back them up, double-check, then delete the originals from your PC.

7. TURN ON STORAGE SENSE

Some of those big, SSD-eating files can actually be temporary backups, data files, and the like, hidden deep within your PC. Don't bother managing this yourself. Storage Sense does it for you (fave.co/3pQBvLl). This feature eliminates

Storage Sense can handle a lot of your PC's cleanup tasks, automated and in the background.

temp backups, deletes old files in the Recycle Bin, and removes local files from your PC *if* they've been backed up online.

I usually trust Storage Sense to make the smart decisions here, although I always turn off the option to delete files in my Downloads folder.

8. DISABLE UNWANTED STARTUP PROGRAMS FOR IMPROVED PERFORMANCE

These suggestions will clean up your hard disk. Blocking apps from loading themselves during the boot process (fave.co/42KsCRU), however, will speed boot times and help reduce the strain on your computer's RAM or memory.

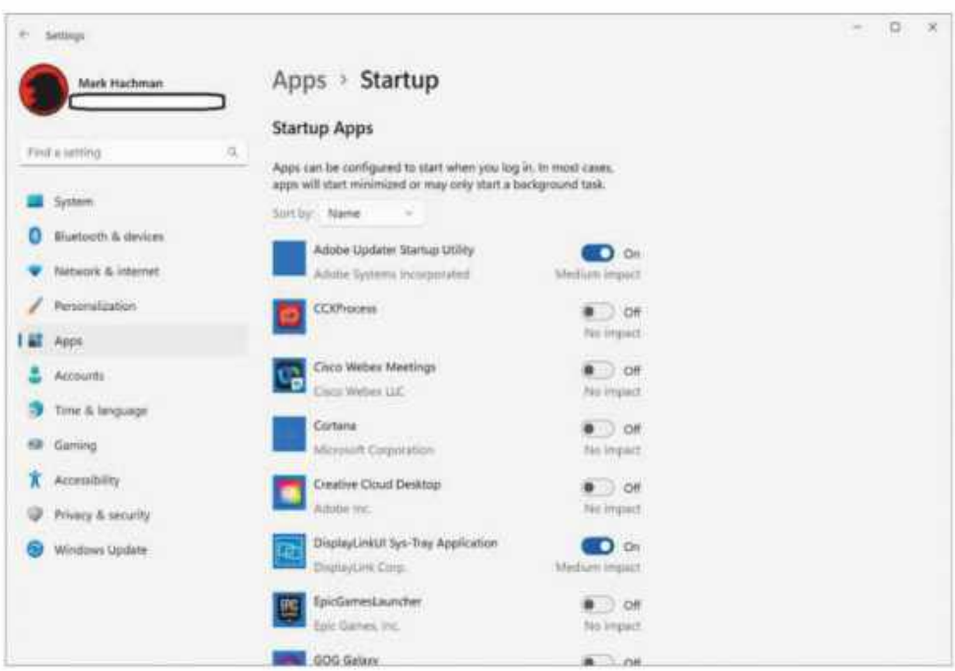
Programs want to helpfully load themselves into memory to be available right away! But that's really not necessary in all cases. Simply launching the program will do all that, costing you a spare second or two. (The exception are some security programs like antimalware, which should always run beginning at startup).

The Windows Settings menu (Apps > Startup) allow you to toggle apps on and off at startup, along with providing a broad generalization of what effect that will have on your PC. Again, the rule of thumb is if you don't know, leave the app on. Feel free to research it, though. If it's entertainment related, you can probably turn it off.

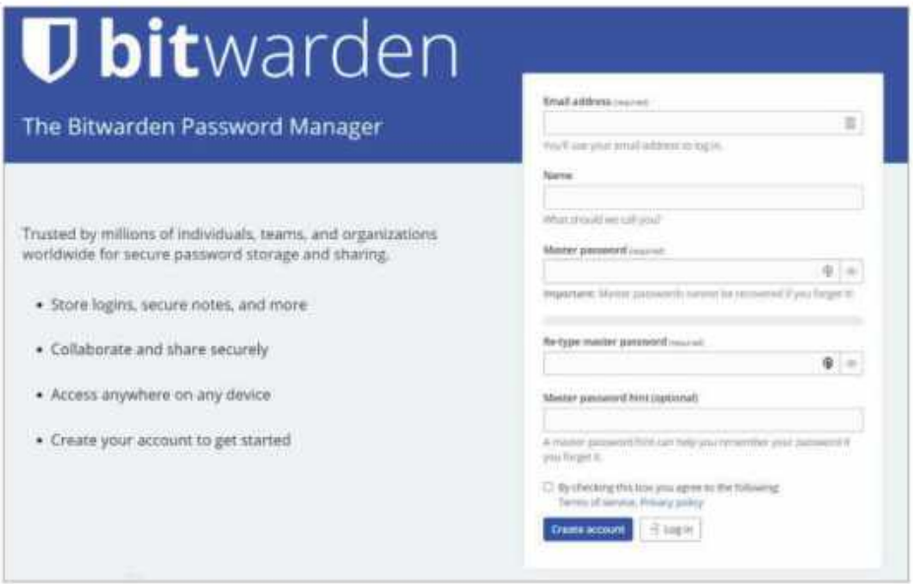
9. ELIMINATE BROWSER PLUG-INS YOU DON'T USE

We all spend a lot of time on the web, and your browser is like your PC: If you're using plug-ins and add-ons that you don't need, you should either disable them or remove them entirely. By doing so, you'll reduce the amount of memory your browser consumes, which will then improve your PC's overall performance.

In Google Chrome, open the menu with three vertical dots in



You don't need as many apps as you think when booting up your PC.



It's a good idea to use some form of encrypted password manager to provide an extra layer of security.

upper right corner. Scroll down to More tools, and then Extensions. Remove or disable anything you don't need.

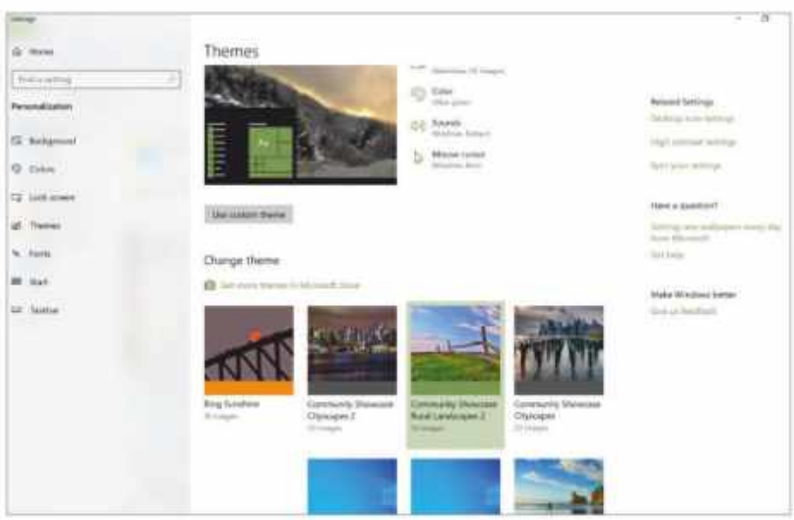
In Microsoft Edge, click the ellipsis menu (…) and navigate down to Extensions. That will open a small popup window where you can remove unwanted extensions.

10. SECURE YOUR ONLINE LIFE

This won't help your PC's performance, just your peace of mind. Whether you use a password manager (fave.co/3IRkfRz) or you manage your passwords through your browser, check to see if any of your passwords have been exposed and change them if necessary. Take an additional step and review which sites also have access to your digital credentials. It can be quite handy to use your Microsoft ID or your Google identity to log on to a new site or service, but there's no reason to let them have access to your personal information if you don't need to. (To check which apps have access to your Google account, use Google's instructions [fave.co/42Kc8JI]. Microsoft has similar information on its own site [fave.co/3WbaEpe].)

11. PERSONALIZE YOUR PC

How does personalizing your PC make you more efficient? Well, you may hate Windows' visual effects, like transparency and



Personalization is a real strength of Windows 10.

animations—you can turn these off via the Settings menu (Accessibility > Visual effects). But they may also involve configuring it to make it feel familiar and fun (fave.co/3L5Qmr4), too.

In certain cases, you may also want to try playing around with third-party utilities like Start11 (fave.co/3Ooi0l4) to tweak Windows. Explorer Patcher (fave.co/42ZGult) is another great option and it's free, too. Hate the way the Taskbar or Start menu looks? Tweak them and make *you* more efficient when using Windows.

12. RESET YOUR PC

If you *really* want to clean your PC of all digital junk, resetting your PC is a viable option. A clean install (whether it be from the cloud or some other installation media) should really be considered as a last resort for novice users because it will eliminate all the apps from your PC—and possibly your user files, too.

Taking a few minutes to physically clean your laptop is a good idea.

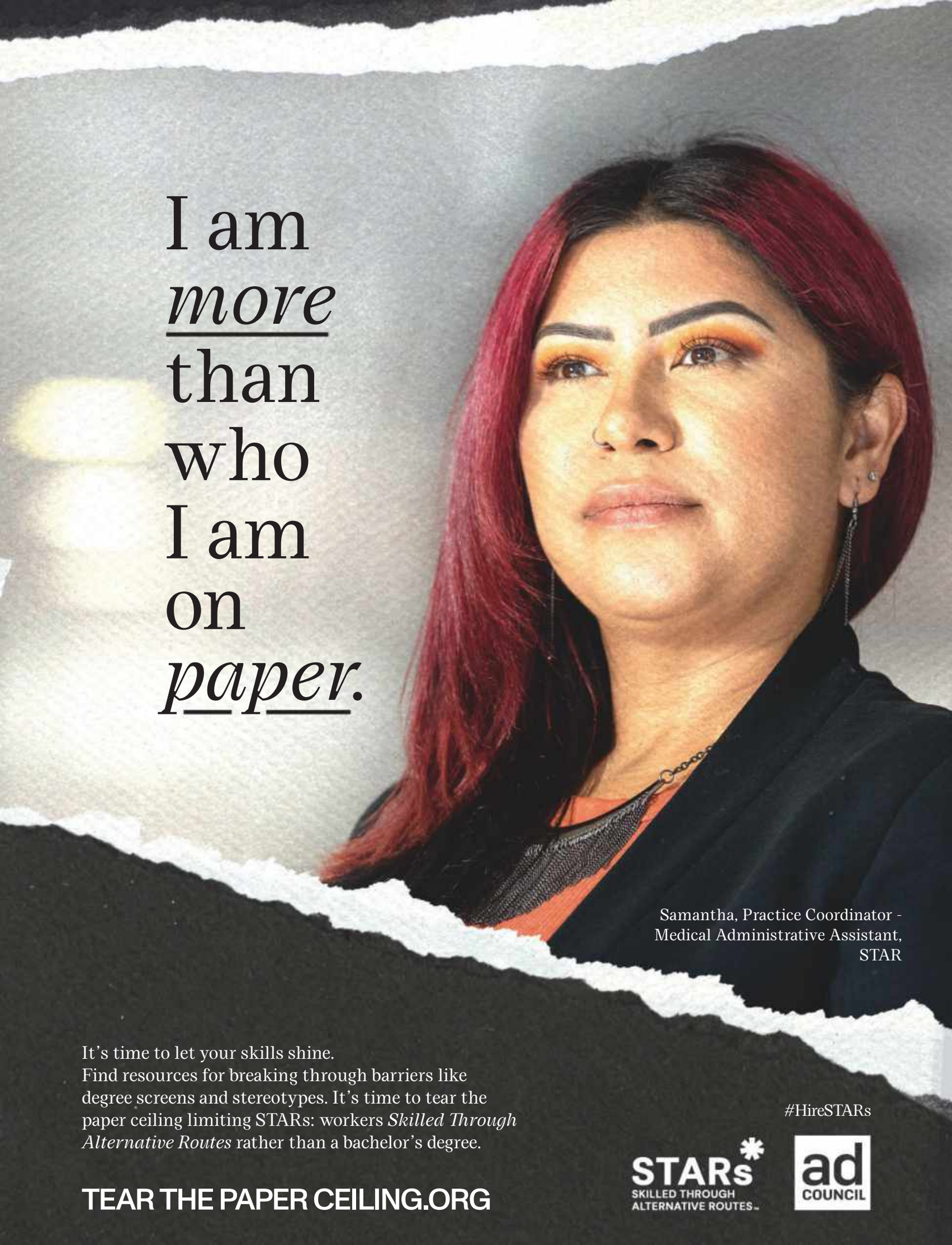
The process of how to reset your PC on Windows 11 (fave.co/3ohXfzb) is nearly the same as it is on Windows 10. Just be aware that you may have spend additional time installing and/or restoring apps and data. The process of resetting your PC is designed to restore your PC to a brand-new state, though.

13. HOW TO ACTUALLY *CLEAN* YOUR PC

After all that tapping, swiping, and clicking, your PC may actually need, you know, cleaning. We have you covered here, too. Take that dirty laptop and clean it the right way (fave.co/3Oio1C4) with our step-by-step guide. Just make sure to power it down before you get started.

Why should you care about a clean PC? A desktop or laptop clogged with hair, lint, dust bunnies, or more can prevent the fan from turning efficiently. An improperly cooled laptop will run slower than usual. A clean PC is a fast PC!

Yes, there are other ways to optimize your PC—installing an SSD into a desktop (fave.co/3z58UEf) or into a laptop (fave.co/3pUO3RG) are excellent, relatively easy tuneups to boost your PC's performance. But they cost money! These tips are fast, free ways of getting your PC in shape and running great.


I am
more
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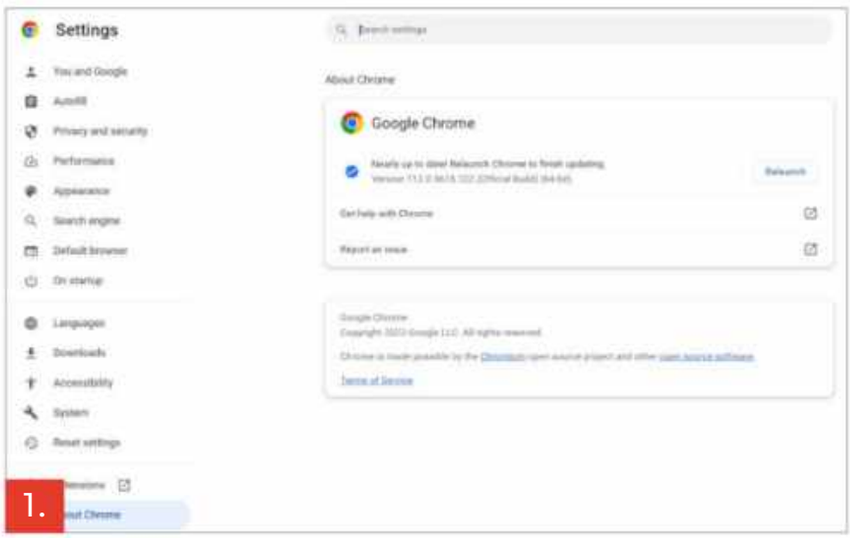
paper.
Samantha, Practice Coordinator - Medical Administrative Assistant, STAR
It's time to let your skills shine.
Find resources for breaking through barriers like degree screens and stereotypes. It's time to tear the paper ceiling limiting STARs: workers *Skilled Through Alternative Routes* rather than a bachelor's degree.
TEAR THE PAPER CEILING.ORG
#HireSTARs
STARs
SKILLED THROUGH ALTERNATIVE ROUTES
ad COUNCIL

SPEED UP GOOGLE CHROME: 9 TIPS AND TWEAKS

WE HAVE THE TECHNOLOGY. WE CAN MAKE CHROME BETTER THAN IT WAS BEFORE.

BY MARSHALL GUNNELL



Google Chrome, the most popular web browser for PC users, initially delivers a fast and responsive browsing experience. However, over time, Chrome can become sluggish due to factors like cache files, extensions, and resource consumption.

There are many ways to improve Chrome's performance, such as keeping your browser up to date, clearing the cache, and taking advantage of some available special features. Here are nine fairly simple ways to keep Google Chrome running as fast as possible.

1. ALWAYS UPDATE CHROME

Updating Google Chrome to the latest version ensures that you have the most recent performance improvements, bug fixes, and security updates. Google frequently provides updates to its browser, so it's important to always stay up to date.

Chrome is designed to update automatically in the background when you close your browser. If you're like the many out there who almost never close their browsers, you should check for an update.

Chrome will place a button in the top-right corner of the browser window when it's time for an update. Just click it to update Chrome. If you don't see it, in the top-right corner of the window, click the **three vertical dots (...) > Help > About Google Chrome**. Here, Chrome will check and install updates. Click **Relaunch** to finish updating Chrome. Chrome will close, so make sure

you don't have any unfinished work open in a tab.

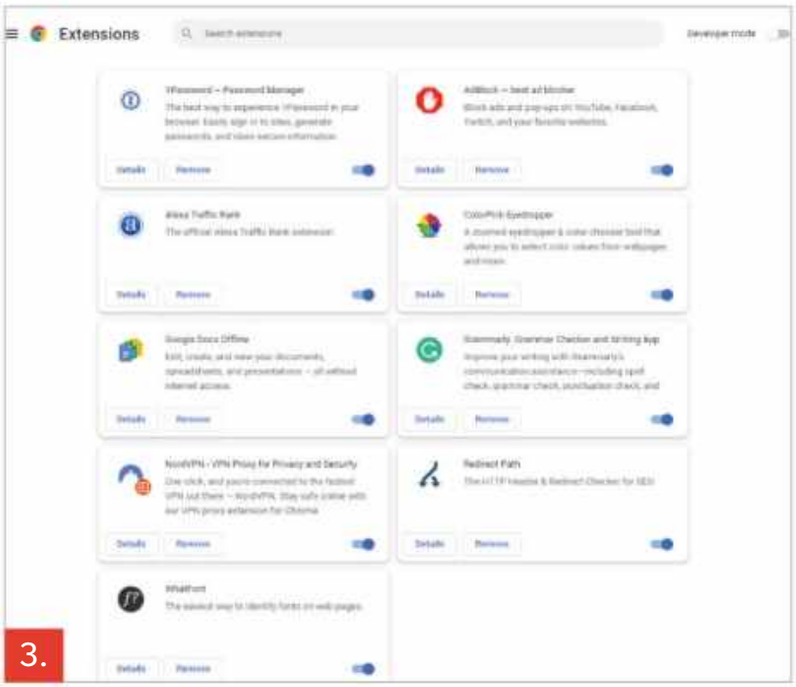
2. BE CONSERVATIVE WITH YOUR TABS

Having multiple tabs open (fave.co/3pNN2uO) in your browser consumes memory (RAM) and, to a lesser extent, processing power (CPU). As the number of open tabs increases, so does the demand on your computer's resources. This can lead to slower performance, increased page load times, and even crashes or freezes if your system becomes overwhelmed.

3. DISABLE UNUSED EXTENSIONS

Extensions (fave.co/42FqATi) are small software programs that add functionality to your browser. They can be useful, but having too many extensions installed or using poorly optimized ones can negatively impact Google Chrome's performance. Disabling unnecessary extensions can help speed up your browser's performance.

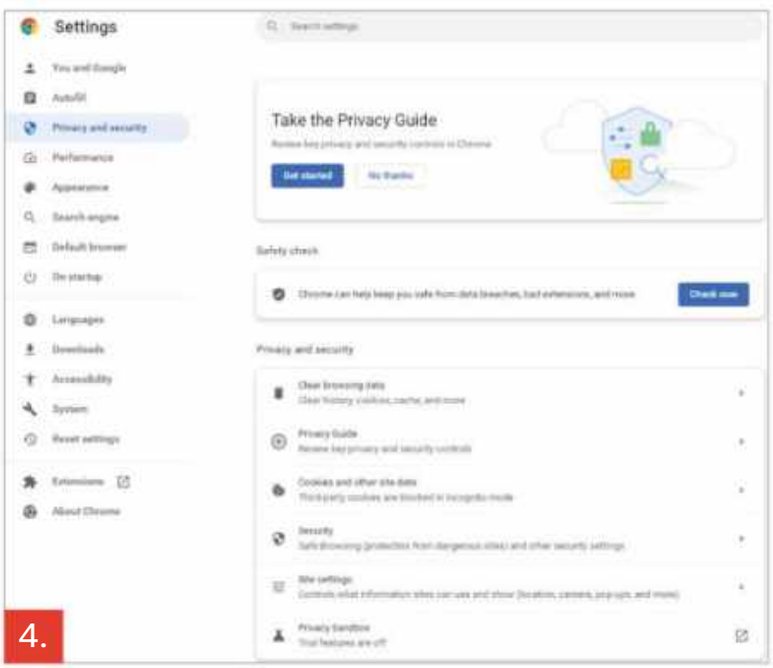
You can disable browser extensions by going to **chrome://extensions** and then toggling the extension's slider to the **Off** position, or by clicking **Remove**.



3.

4. CLEAR YOUR BROWSING DATA

Clearing browsing data, including history, cookies (fave.co/45bRtQg), and cached files, can enhance performance by freeing up disk



4.

space and resolving website issues caused by outdated or corrupted files. This not only improves system performance but also enhances privacy and security.

Clearing browsing data can also lead to better performance by reducing RAM usage since cookies and cached files are usually stored in your computer's RAM for quick access. This usually means smoother browsing and faster page-loading times, especially if your device has limited memory.

You can clear your browsing data by clicking the **three vertical dots > Settings > Privacy and Security**. Here, you'll select each option individually and delete the data.

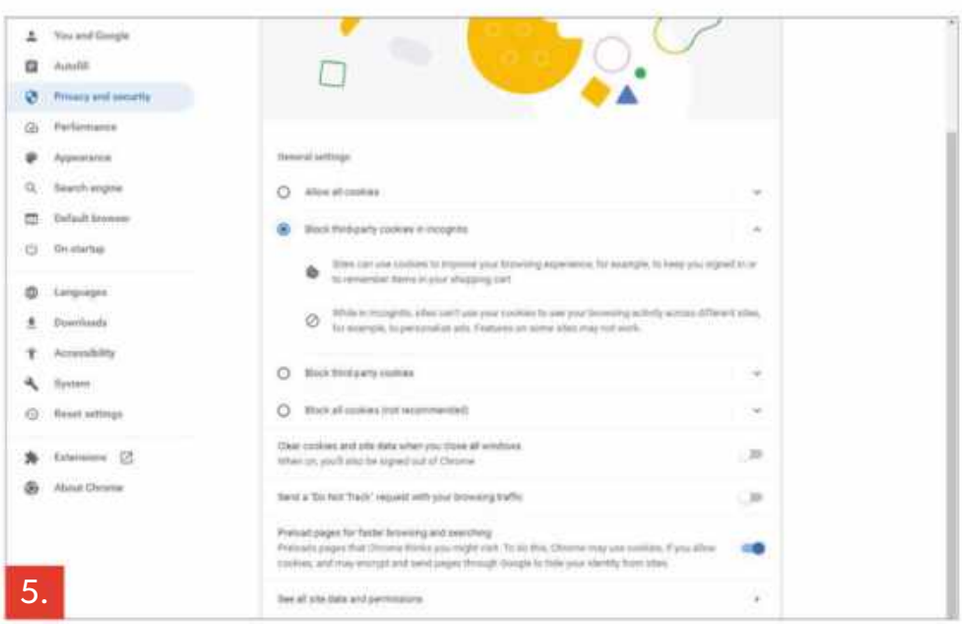
5. PRELOAD WEB PAGES

Preloading web pages improves performance by fetching and loading resources for a web page before you actually navigate to it. When you hover over a link or when the browser predicts that you're likely to visit a particular page, Chrome can start fetching the resources (such as images, CSS, and JavaScript files) needed to display the page. This is done in the background while you're still on the current page. When you eventually click the link, Chrome has already loaded much of the content, so the page appears to load faster.

You can enable the feature to preload web pages by clicking the **three vertical dots > Settings > Privacy and Security > Cookies and other site data**. Toggle the slider next to **Preload pages for faster browsing and searching** to the **On** position.

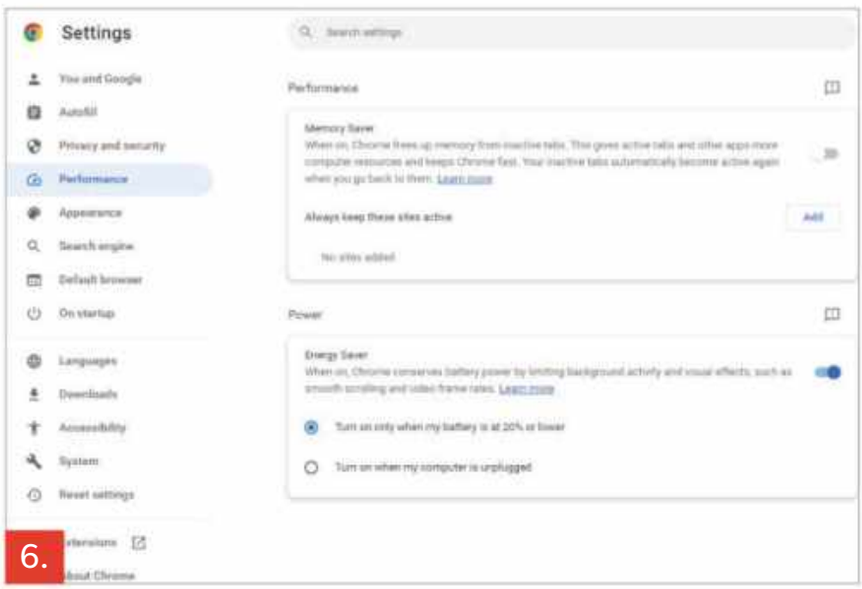
6. USE CHROME'S ENERGY SAVER

Chrome's Energy Saver's main function is to conserve battery life, but it also improves performance a bit by limiting certain background activity. You can set Energy Saver to only turn on when your battery hits 20 percent capacity, but you can also enable it when your computer is unplugged.



5.

To enable Energy Saver, click the **three**



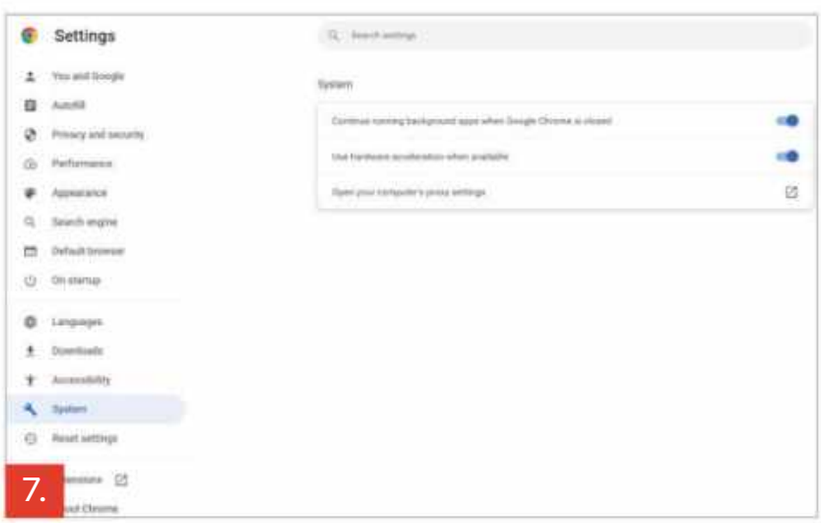
vertical dots > Settings > Performance. In the Power group, toggle the slider next to **Energy Saver** to the **On** position. Next, choose when you'd like this feature to activate.

7. TURN ON HARDWARE ACCELERATION

Hardware acceleration tells Chrome to use your computer's GPU for specific tasks that can benefit from it. GPUs are designed to handle graphics-intensive tasks efficiently and can parallelize certain operations, making them more suited for tasks like rendering graphics, animations, and video playback.

By offloading some of these tasks from the CPU to the GPU, you'll see improved performance, smoother rendering of web content, and reduced system resource consumption. This can be especially beneficial on systems with powerful graphics (fave.co/3DOEuWk) or when using applications and websites with heavy graphical elements.

To enable hardware acceleration, click the **three vertical dots > Settings > System**. Here, toggle the slider next to **User hardware acceleration when available** to the **On** position.



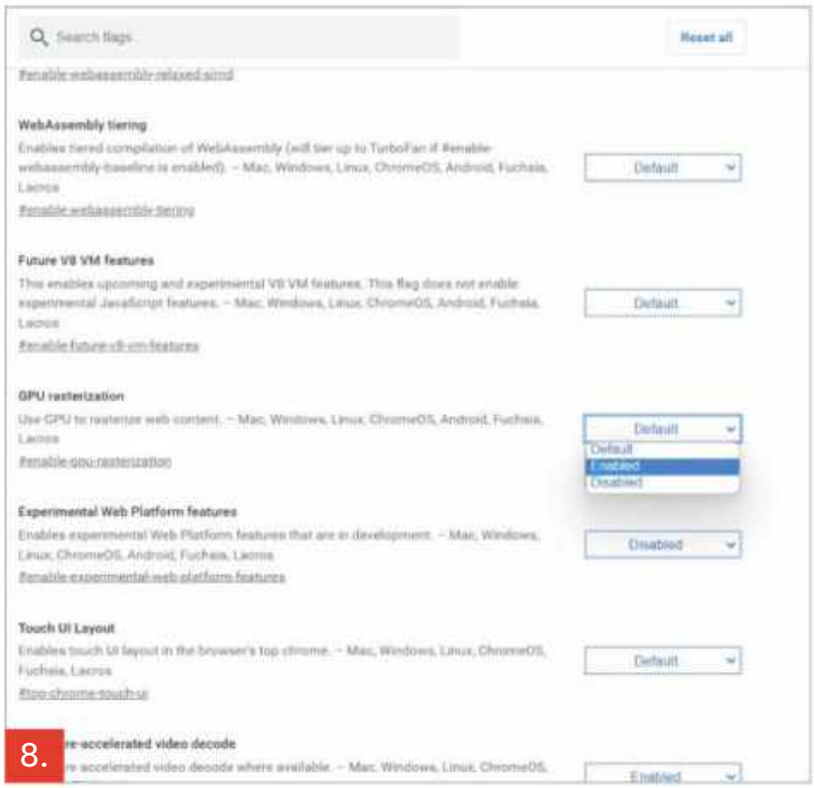
8. ENABLE GPU RASTERIZATION IN GOOGLE FLAGS (EXPERIMENTAL)

Rasterization is the process of converting vector graphics (like HTML, CSS, and SVG elements) into pixels that can be displayed on your screen. By default,

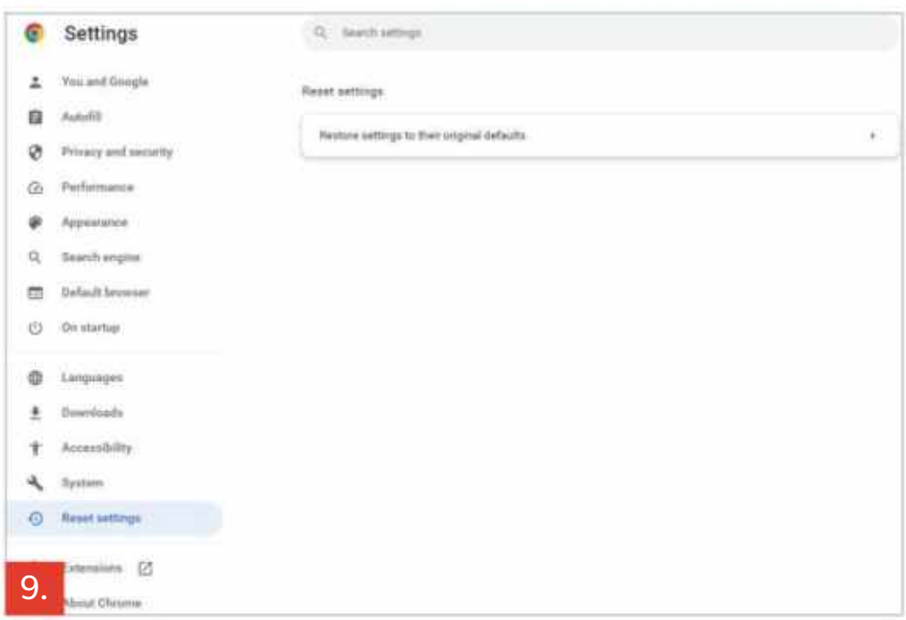
Chrome uses the CPU for rasterization.

Enabling GPU Rasterization offloads this task to your computer's GPU instead. GPUs are designed to handle graphics processing more efficiently than CPUs, which can lead to faster rendering of web pages and improved performance, especially on systems with a powerful GPU.

You can enable GPU rasterization by going to **chrome://flags**, searching **GPU Rasterization**, and then selecting **Enabled** next to it.



It's worth noting that these are experimental features, and Google Chrome is pretty clear about only using these for testing purposes. Just because you can use it doesn't mean you *should*. The risk may be higher than the reward. And if you've enabled Hardware Acceleration, then you already have rasterization enabled anyway.

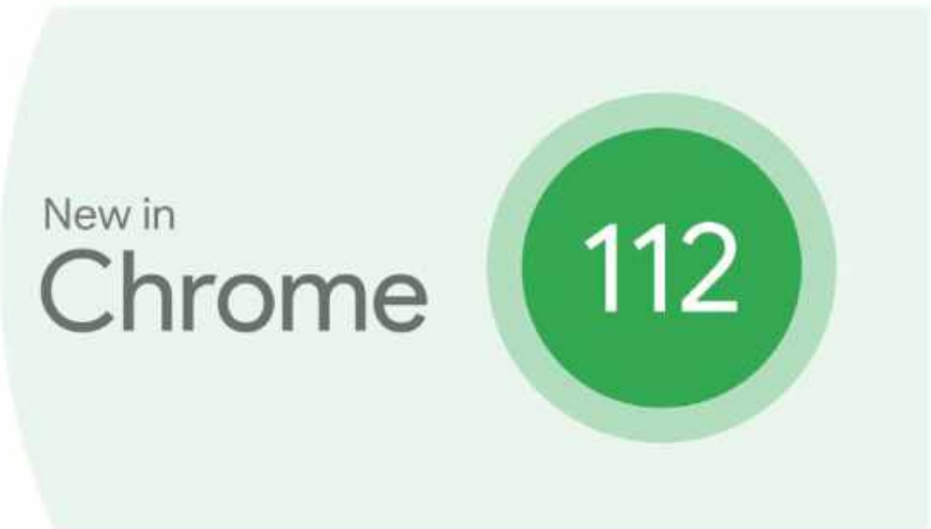


9. RESET GOOGLE CHROME

Resetting Chrome to its default settings can resolve performance issues by restoring the browser to its original configuration, eliminating any customizations, extensions, and settings that may be causing

slowdowns or other problems.

You may want to do this if you've tried other performance improvement methods without success or if you're unsure about which specific settings or extensions are causing the issues.

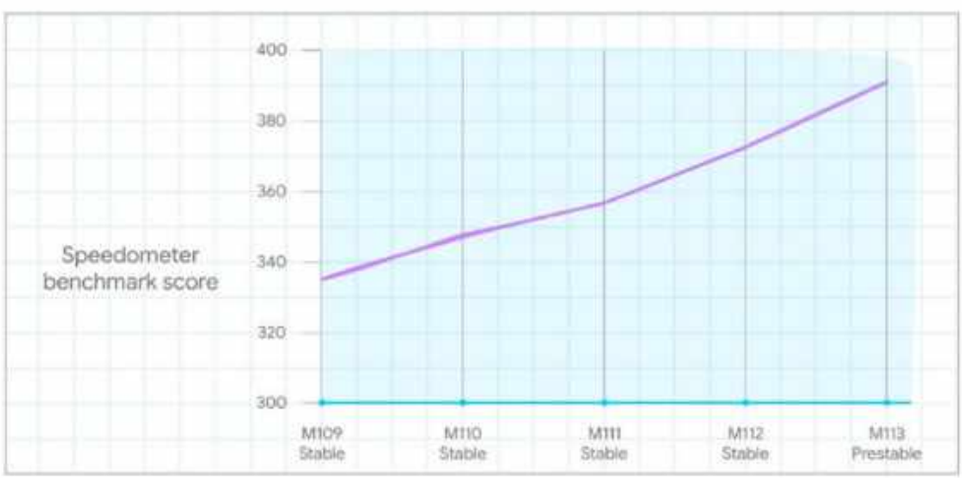


Chrome 112 brought a huge improvement in performance.

To reset Google Chrome, click the **three vertical dots > Settings > Reset Settings**. You'll find the option to reset Chrome to its default settings on this page.

GOOGLE ALREADY MAKES CHROME FASTER

Google Chrome 112 (fave.co/458NmEE) brought significant performance improvements to the popular web browser.



In a blog post (fave.co/437thwG), Google revealed a 10% increase in Apple's Speedometer 2.1 browser benchmark.

Optimizations have been made to JavaScript functions such as toString() and join(), as well as specialized fast paths for parsing innerHTML.

These features are extensively utilized across numerous websites and web apps, resulting in a noticeable difference in web browsing. Google reported a 10% increase in Apple's Speedometer 2.1 browser benchmark (fave.co/41JM7ci) over three months due to these improvements.

This is yet another reason to always keep Chrome up to date. Google is constantly bringing performance updates to Chrome, so let them do the hard work for you.

Vaping can
cause irreversible
lung damage.
TalkAbout
Vaping.org
Get the facts
about youth vaping.
American
Lung
Association.
ad
COUNCIL
#DoThe
VapeTalk

Bring back Windows 11's missing features with this free app

This free program restores Windows' taskbar labels and more. **BY JARED NEWMAN**

If you're accustomed to longtime Windows creature comforts such as the "Never combine" taskbar (fave.co/3JIxpcU), upgrading to Windows 11 can be a big adjustment. Microsoft changed or eliminated a lot of those features (fave.co/3MKARbu) in pursuit of a more modern, streamlined interface, and in doing so made it harder for some of us to get work done.

But it doesn't have to be that way. With a free, open-source program called Explorer Patcher (fave.co/3Oes2aQ), you can bring back many older features of Windows without missing out on Windows 11's benefits. It only

IMAGE: MICROSOFT

takes a few minutes to set up, and it is brimming with options that can improve your Windows 11 workflow.

Here's how to get started.

INSTALLING EXPLORER PATCHER

Explorer Patcher is a free download on the developer's GitHub page (fave.co/3Oes2aQ), though the actual download link is a bit buried.

To find it, scroll down to the How To section (fave.co/42VADDs) and click the link to "setup program." Or just use this direct download link (fave.co/41MPAqv). Once you've downloaded the EXE file, just double-click it to install.

Quick disclaimer: Microsoft has previously warned against using Explorer Patcher due to a bug that at one point prevented devices from starting up (fave.co/3BxGaEH). While Explorer Patcher quickly resolved this issue, using any program that drastically modifies the core Windows interface carries some risk, especially if you don't regularly back up your data (fave.co/3OjP0xs).

Still on board? Let's walk through all the things Explorer Patcher can do.

HOW TO MODIFY THE WINDOWS 11 TASKBAR

Right-click the taskbar after installing Explorer Patcher, and you'll see a new Properties option that brings you to the app's main menu.

Your first stop should be the Taskbar section. Set the Taskbar Style to Windows 10, and you'll see all kinds of options for modifying it. A few options of note:

Combine taskbar icons: Choose "Never combine" to bring back labels for each individual window.

Primary taskbar location: Move the Windows 11 taskbar to the top or sides of the screen instead of the bottom.

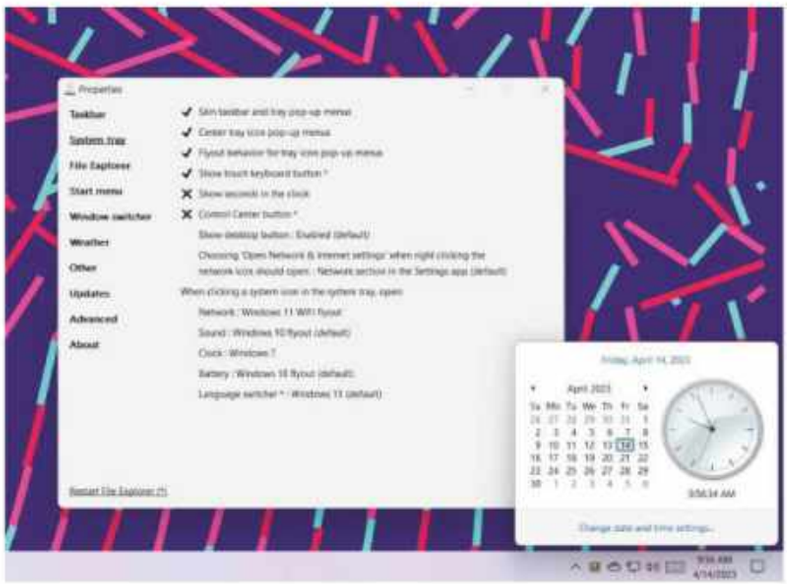
Taskbar icon size: Information density die-hards can opt for smaller icons and labels in this location.

Start button style: Explorer Patcher sets the angled Windows 10 icon as the default, but you can

"Never combine" taskbar icons, it's nice to have you back.

also switch back to the flat Windows 11–style icon.

This section also has options for hiding the search and task view buttons, but these settings are also available in Windows 11 without any extra software.



Prefer the Windows 7 clock? Enable it here.

MODIFY WINDOWS 11'S CLOCK AND NOTIFICATION PANEL

As long as you're tweaking the Windows 11 task bar, take a minute to visit the "System tray" section in Explorer Patcher. You'll find some useful options here as well:

Show seconds in the clock: This one's self-explanatory.

Control Center button: Explorer Patcher breaks out separate taskbar icons for Wi-Fi and sound, so you can hide the gear-shaped Control Center icon for these functions if you like.

Clock: Choose either the Windows 10 or Windows 7 style, and you'll see only the calendar view instead of the full notifications panel when clicking on the time. (After doing this, consider minimizing the Windows 11 clock in the notification panel as well.)

Network: Choose what happens when you click the Wi-Fi or ethernet icon.

Sound and Battery: Switch between Windows 10 and Windows 7 menus for these icons.

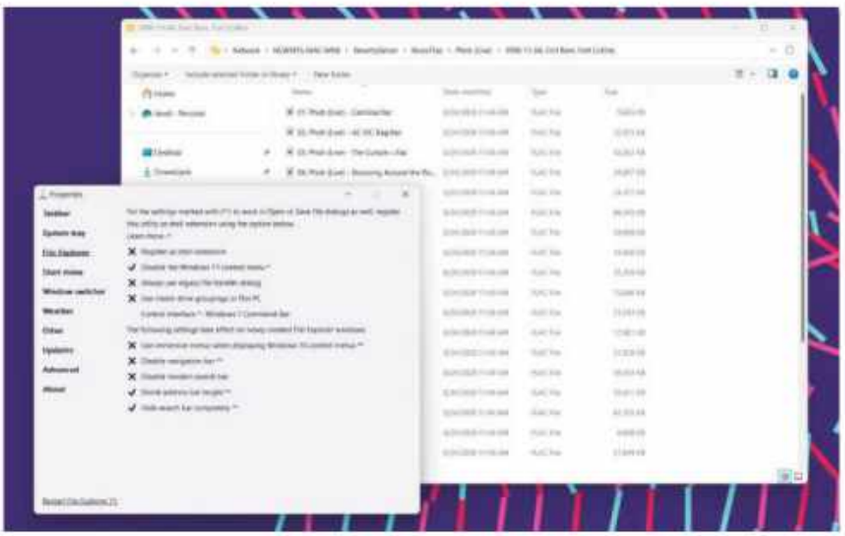
Note that you'll need to click Restart File Explorer in Explorer Patcher's menu to apply any settings that have an asterisk next to them. This will make the taskbar icons temporarily disappear and reappear, and will close any Explorer windows that are already open.

MODIFY WINDOWS 11 FILE EXPLORER

Explorer Patcher's File Explorer section is another big attraction, allowing you to eliminate some of Windows 11's more confounding design choices.

Disable the Windows 11 context menu: Bring back the Windows 10–style menu, which gives quicker access to shell extensions and uses text instead of cryptic icons for things like copy and paste.

Control Interface: Swap the Windows 11 ribbon for the Windows 10 version or the



The Windows 7 control bar holds up surprisingly well.

old Windows 7 command bar (which holds up surprisingly well).

Register as shell extension: This is required for settings that have double asterisks (**) next to them, including "Shrink address bar height," "Disable navigation bar," and "Hide search bar completely."

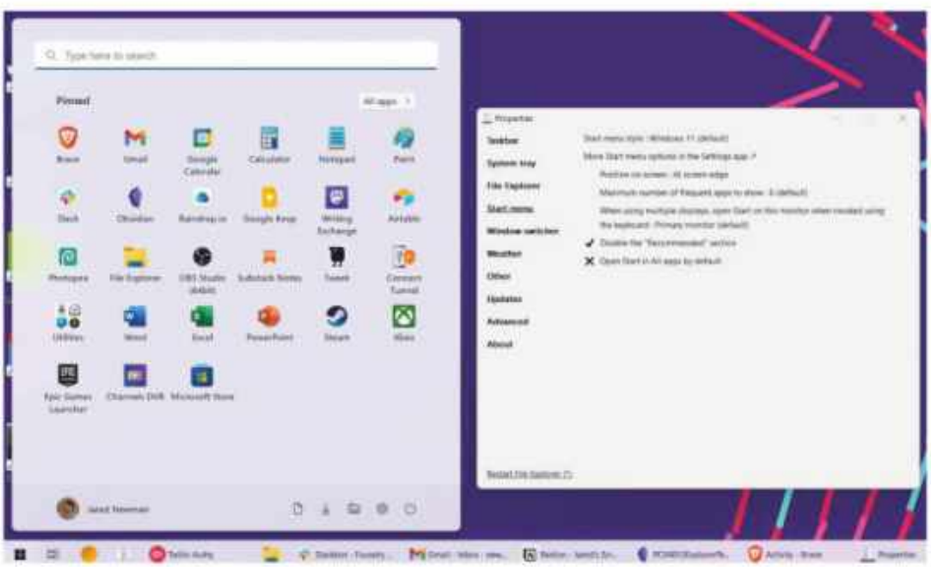
TWEAK THE WINDOWS 11 START MENU

While Explorer Patcher doesn't offer the deep Start menu customization found in Start11 (fave.co/3Ooi0l4), it does offer a few helpful options:

Start menu style: Bring back Windows 10's expandable Start menu, complete with tiles and zones. (Note that you can only add apps to this Start menu through File Explorer.)

Disable the Recommended section: Add two more rows for pinned apps in the Windows 11 Start menu by hiding the section for recent apps and documents.

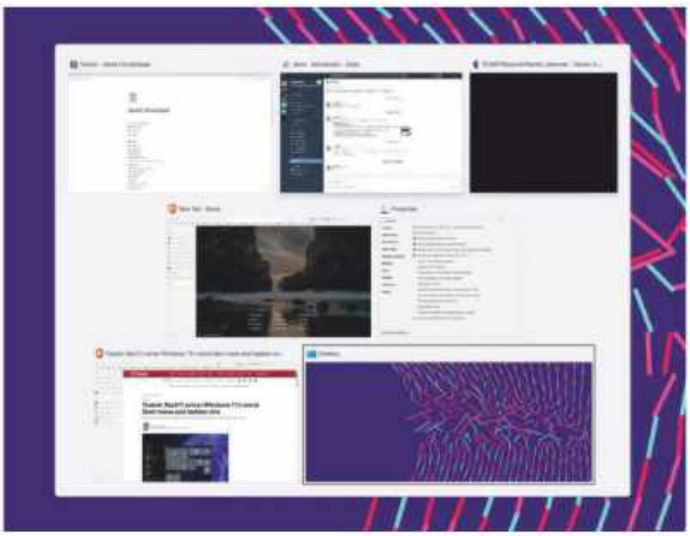
Open Start in All Apps by default: Jump straight to the alphabetical app list when you click the Start button.



Hiding the Recommended section leaves more room for pinned apps.

CHOOSE YOUR WINDOWS 11 ALT-TAB MENU

Explorer Patcher's other tentpole feature is its ability to customize the multitasking menu. Just head to the "Window switcher" section, and you'll see a single item with a handful of options in its drop-down menu:



Explorer Patcher's Simple Window Switcher is deeply customizable.

Windows 11: A wide Alt-Tab menu with rounded window corners.

Windows 10: A slightly more compact menu with not-as-rounded corners.

Windows NT: A supercompact menu with app icons only.

Simple Window Switcher: A menu with customizable height, width, opacity, padding, and scroll wheel controls, plus an option to show the desktop.

MORE EXPLORER PATCHER OPTIONS

Beyond the options above, Explorer Patcher has a handful of other toggles that are worth considering, located in the appropriately named Other tab:

Open clock flyout: Use Win+C to show the clock instead of Teams.

Disable rounded corners: Brings back more of the Windows 10 aesthetic.

Disable quadrants when snapping windows: This makes two-way split-screen mode much easier to invoke.

UNINSTALLING EXPLORER PATCHER

Explorer Patcher is easy to remove, as you'll find it inside Windows 11's app list. Just head to Settings > Apps > Installed Apps, search for Explorer Patcher, then tap the ellipsis (…) and click the Uninstall button. Depending on which options you've enabled, you may need to restart your PC to complete the removal. Otherwise you'll merely see the taskbar disappear for a moment before reverting to its old self.

If you're a veteran PC user struggling with Windows 11, however, chances are you won't want to go back after giving Explorer Patcher a try.

Not a fan of Windows 11's rounded corners? Not a problem.

5 Gmail settings I always change (and 3 more I turn off)

I don't need grammar suggestions, thanks. **BY ALAINA YEE**

Gmail is popular for a reason—it comes packed with quite a few features. But some of its default settings can be annoying or limited.

Fortunately, you can fix that. Dive into the settings and you'll find a surprising number of tweaks you can make to the interface. If you haven't already spent some time in there, I highly recommend it. You may find a few features you didn't know about before.

Not sure where to start? You can take a cue from my favorites. Among the list are five settings I absolutely have to change in order to find Gmail usable, and they're pretty universal. Try them out, and if you don't end up liking them, you can make different adjustments for your account.

IMAGE: DIEGO THOMAZINI/SHUTTERSTOCK

These are so helpful for keeping track of my important email.

Maximum page size: I can't stand seeing only a handful of messages at one time, and to me, anything under 50 messages is a handful. I bump that number straight up to 100.

Undo send: Sometimes I'm too quick to tap Send on an email (or Alt + Enter). Enabling this feature lets me snatch back the email before it's truly sent to fix a typo or rephrase a sentence I'm having second thoughts about. I set my window of opportunity to the max of 30 seconds, but you can go shorter.

Keyboard shortcuts: I'm fast with a mouse, but even faster when jamming on my keyboard. With only a handful of these enabled, they make my life so much easier. And if I ever forget a command, typing a question mark (?) while in Gmail brings up a handy cheat sheet. Plus, you can also turn on custom keyboard shortcuts to really supercharge these.

Unread message icon: For some people, seeing how many unread messages they have isn't useful (and might give some the heebie-jeebies). But I leave only messages requiring follow up in my Inbox, so seeing that icon number change offers a subtle and effective way to know when I should jump back into my Gmail tab.

Stars: You can star email to more easily follow up on the messages—but that one yellow star is a default that's easily changed to include more color options. I detailed the step-by-step method of turning these on (fave.co/3BD7Ck9) in a separate tip, precisely because going from one color to the full set of 12 was a productivity game-changer for me.

I love these as a starter set, but there are other settings I like to turn off, mostly because they annoy me as a writer and editor—the grammar suggestions, smart compose, and smart reply. The first two irritate me (for now, Google doesn't know the English language better than I do), and the latter always makes me feel like I'm going to press the wrong button and not only send a stiff, canned robo-response—but send it to someone I absolutely didn't want to send one to.

Once you've tried these on for size, you can do other things in Gmail to make it work better for you. Perhaps it's time to purge unneeded email, fave.co/3TOQKhi (which might make the unread message icon a more useful feature). Or if you need, you can download a copy your email (fave.co/434LH15). And of course, if someone just won't quit sending you unwanted email, you can block them (fave.co/40qlrvr).

8 Microsoft Windows tweaks that help ease eye strain

Make it easier to work within Windows with these visual tweaks. **BY MARK HACHMAN**

After a long day of staring at a screen, your eyes can feel tired. Luckily, Windows offers several tools for those who have trouble seeing, either because of simple fatigue or a disability. Taking advantage of these features can ease eye strain, making you feel fresher and more productive.

Accessibility is a major strength of the Windows operating system. Both Windows 10 and 11 offer numerous ways to make working easier on the eyes. Keep in mind that all eyes are different! Some forms of assistance might be useful, while others might not be. All of our tips are free, though we're going to offer one

IMAGE: MICROSOFT

hardware-based suggestion that you will need to pay for.

Are you on the hunt for a new monitor? If so, you should check out our roundup of the best monitors available today.

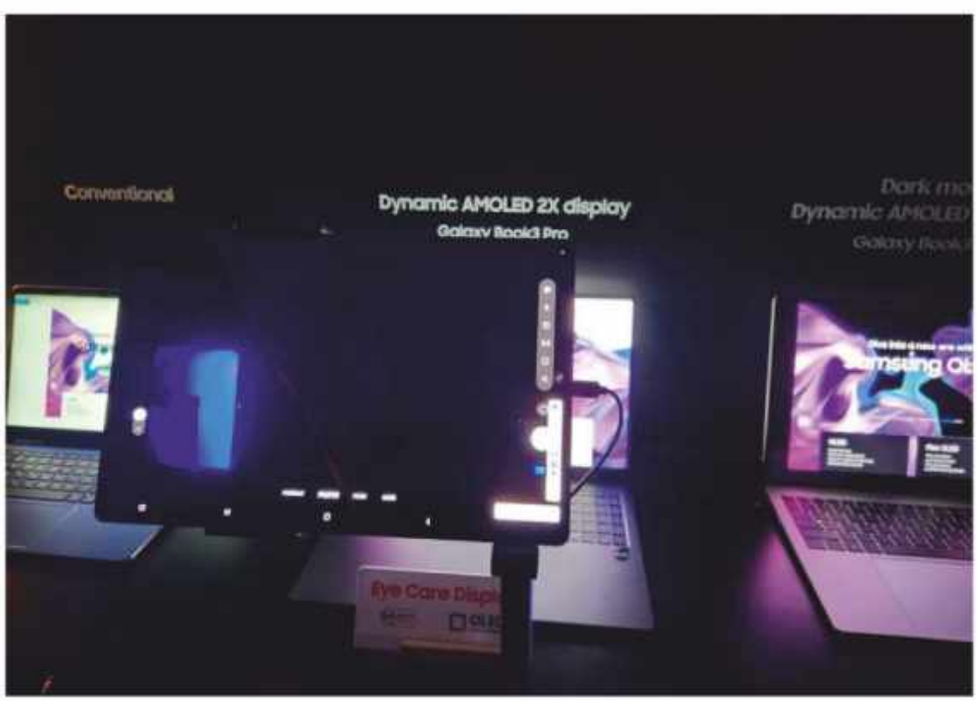
1. BUY A BETTER MONITOR

More and more, laptop makers and display manufacturers are offering high-refresh-rate displays that push above the default refresh rate of 60Hz. These are primarily offered for gamers and smoother inking for professional artists, but your eyes can thank you, too. When a screen refreshes, your eyes have to compensate. But at a higher refresh rate these constant updates blur together, easing the strain on your eyes. Just don't push it too far: Even Samsung, a display manufacturer, thinks 75Hz is enough (fave.co/4592t0N).

Keep an eye out for displays that advertise themselves as flicker-free, too. I'd prefer to use LED bulbs at our house, but my wife complains that even flicker-free LED bulbs can trigger her migraines. Some displays use a technology called pulse-width modulation to manage the amount of light generated by the brightness controls. You might not be able to consciously sense the flickering, but your eyes might.

(Open these images in a new tab to help preserve *your* tired eyes.)

I prefer big, bright displays that offer HDR capabilities for gaming, but that's not for everyone. Display luminosity (how much light a display puts out) is generally measured in nits. We consider about 250 nits or so to be suitable for everyday use; some laptops put out much more than that so that they can be used outside. You can avoid flickering issues by buying a 250 to 300 nit display and running it at maximum brightness.

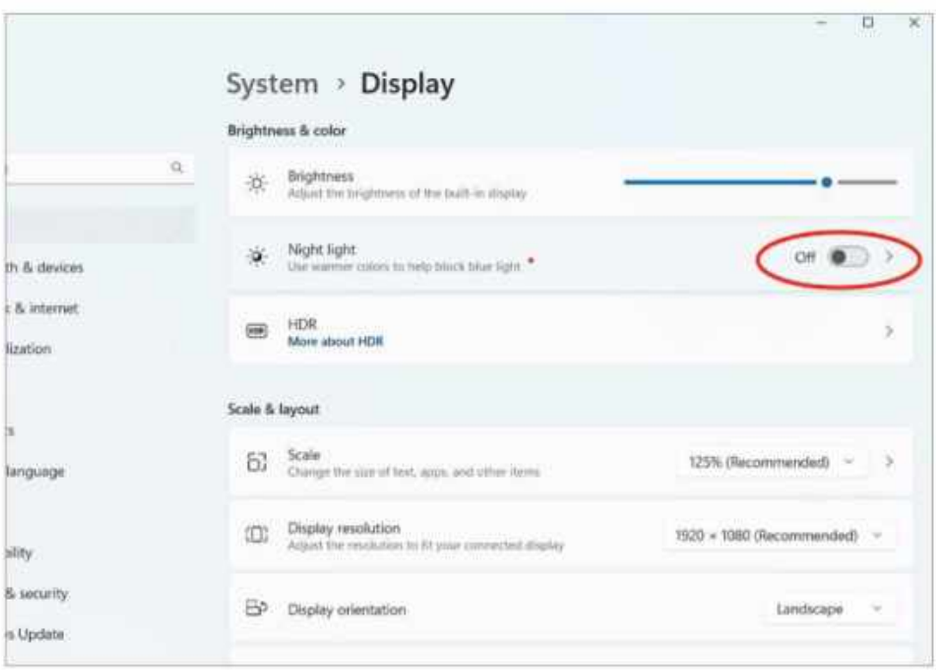


It's not the best photo but conventional laptops can put out quite a lot of blue light, as evidenced by this imaging device. The conventional laptop puts out much more blue light than the Samsung Galaxy Book3, which hardly puts out any at all.

2. TURN ON THE BLUE LIGHT FILTER

Some displays, like the Dynamic AMOLED 2X found inside the Galaxy Book3 Pro 360 (fave.co/40rI1oV), promise to cut blue light just through normal operation. Regardless, turning on the blue light filter in Windows 10 (fave.co/3WvgBOh) or enabling the blue-light filter in Windows 11 (fave.co/45dDR73) is a smart, easy way to avoid eye strain and ensure a more restful sleep. Blocking blue light gives your display a yellowish cast, but it's worth it. It's also a lot simpler than buying a screen film or special glasses.

In Windows 11, navigate to System > Display within the Settings menu and turn on "night light." Note that you should be able to schedule Night Light and adjust its strength, too.



Simply flip the switch to enable the blue-light filter within Windows.

3. (DON'T) ADJUST THE RESOLUTION

In general, higher screen resolution usually translates into more detail, so that images, text, and so on are sharp and well defined. You might say, well, adjusting a 4K display to 1920×1080 increases the size of the icons—that's good, right? Not really—this is one adjustment we usually recommend you don't make. Sometimes adjusting the screen resolution too high can lower the refresh rate.

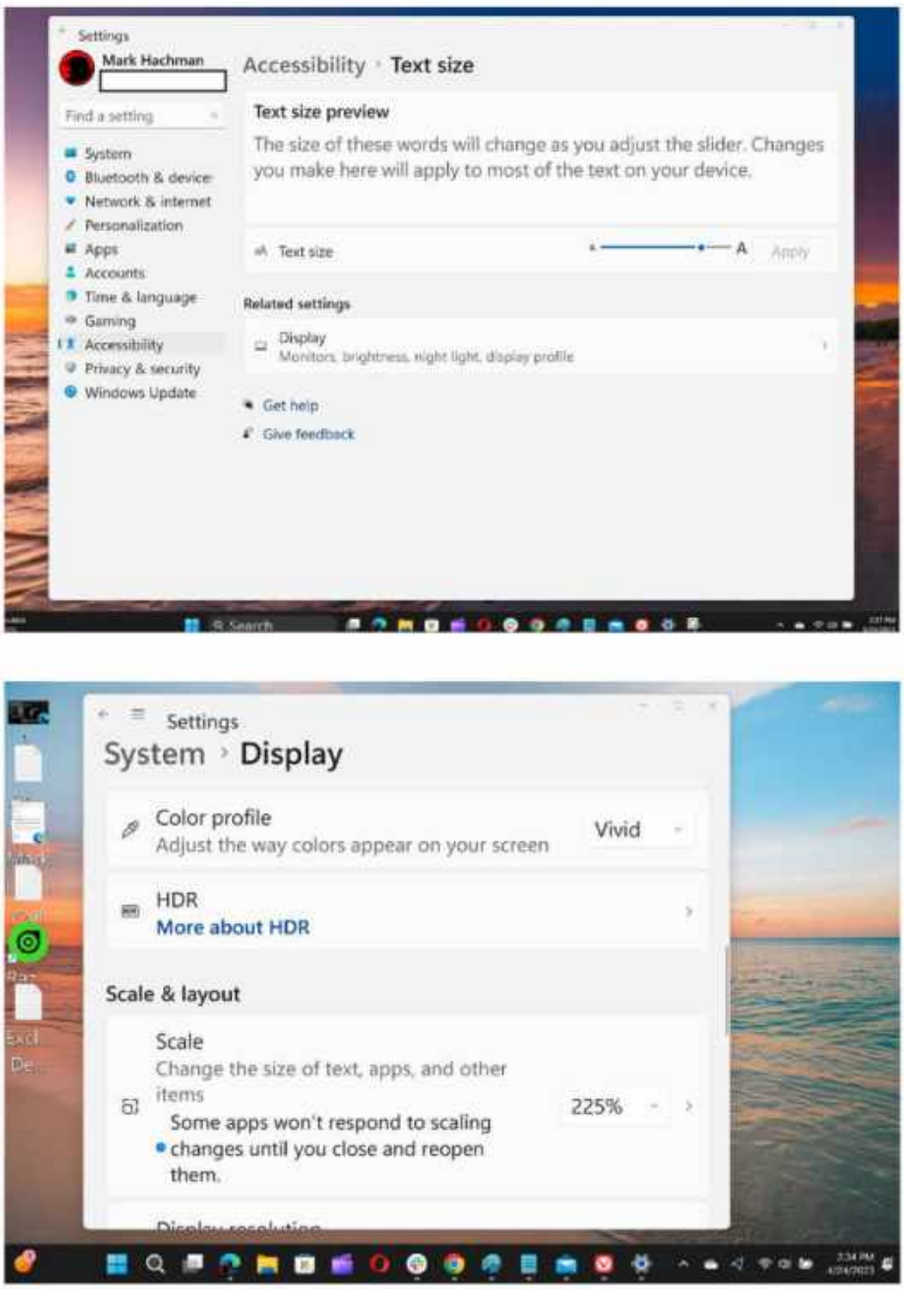
Screen resolution is adjusted on a display-by-display basis. To play around with the settings, go to the Windows Settings menu (System > Display) and click on one of the displays in the diagram. Scroll down to Display resolution and make any tweaks you want to. Just be aware that any changes you make will automatically revert back unless you manually approve them.

4. ADJUST THE SIZE AND SCALE OF ICONS, TEXT, AND MORE IN WINDOWS

That's why adjusting the resolution to change the size of your Windows icons is a bad idea. Windows already offers two different ways to adjust the size of what

you'll see on your display and both are worth knowing about and experimenting with.

In the Windows 11 Settings menu (System > Display) Windows offers the option of **adjusting the scale** of text, apps, and other items. This setting adjusts the scale of the various elements on your screen on a display-by-display basis—you'll need to tweak it for a laptop display as well as any external monitors. As the name suggests, this tweaks the size of everything on your screen such as text, scrollbars, various UI interfaces, the works. We'd agree with Windows that you should choose from the drop-down options instead of playing with custom scaling preferences.



Text scaling (top) versus display scaling (bottom) in Windows 11. Note the differences in the text, icons, and other navigation elements.

A similar setting in Windows 11 (Accessibility > Text size) offers the option of **adjusting the text size** up and down. Doing so enlarges or shrinks the text, but leaves the size of icons and navigation elements unchanged. This isn't a bad idea for users who can recognize the icon of, say, Microsoft Edge without difficulty but struggle to read the text on a page. Just be aware that you'll see a blue screen (not a BSOD) for a few seconds while Windows re-configures itself.

5. USE WINDOWS' BUILT-IN MAGNIFIER TO ENLARGE A PORTION OF THE SCREEN

If you're feeling the occasional need to squint at an isolated graphic or number, you're a good candidate to try out Windows's Magnifier function. This function is off by default, but can be configured to turn on either before or after sign-in via the **Win** and **+** shortcut on the Windows Settings menu (Accessibility > Magnifier). Combining the Windows and plus keys turns on Magnifier, which can be configured as a vertical rectangle, a full-screen enlargement, or a "docked" box that zooms in on a line or two. You can turn off Magnifier with the **Win** and the **Esc** key shortcut and zoom in and out with **Win** and the **–** key.

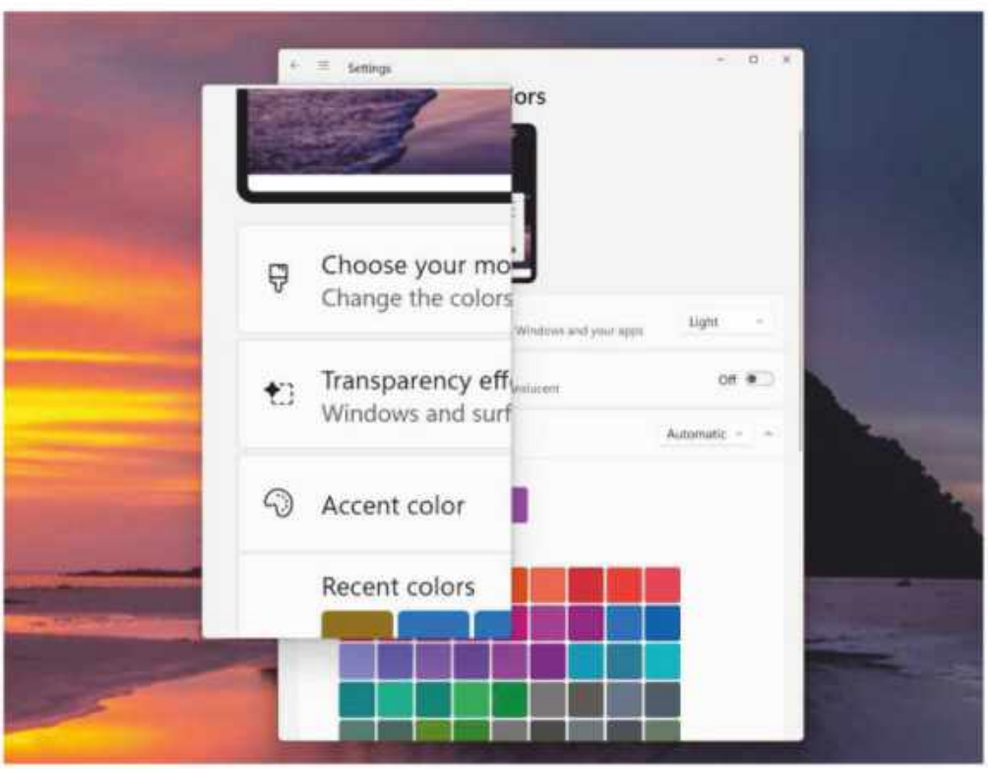
Magnifier is one of the ways to better view some of the tiny details in the Start menu (fave.co/3BDAetK), and there are options to invert the colors of the magnified text to make them easier to read.

For those who are still having difficulty reading, Microsoft includes Narrator and Read Aloud (fave.co/42UeMgc), which are designed for the visually impaired. There's also a Reading shortcut (**Ctrl + Alt** by default), but it doesn't seem to work on my machine.

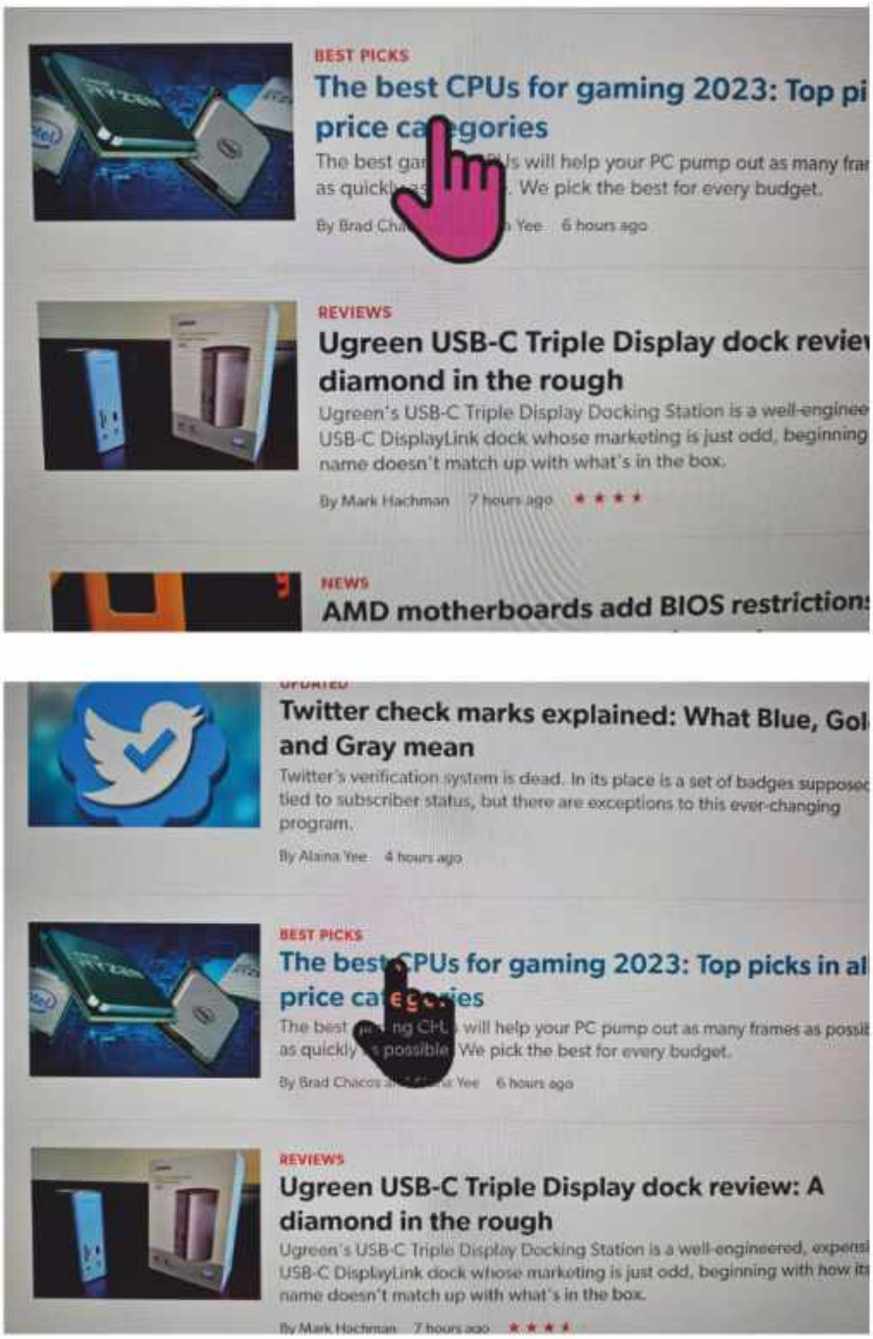
6. ENLARGE YOUR MOUSE CURSOR AND TEXT CURSOR

If you're having trouble tracking your mouse cursor on the screen, you can make it larger and in a different color via the Settings menu (Accessibility > Mouse pointer and touch). Sometimes I will configure the mouse to shift back and forth between light and dark depending upon the background—yes, you can do that!

You can also ask Windows to turn on a "text cursor indicator preview," which adds a spot of



Windows 11's Magnifier is fairly simple to use.



You can configure your cursor in a variety of ways within Windows. You may see the cursor replaced with a bull's-eye in certain situations, if Microsoft thinks you need additional precision.

color at the top and the bottom of any line you're typing. This is surprisingly handy for just about anyone.

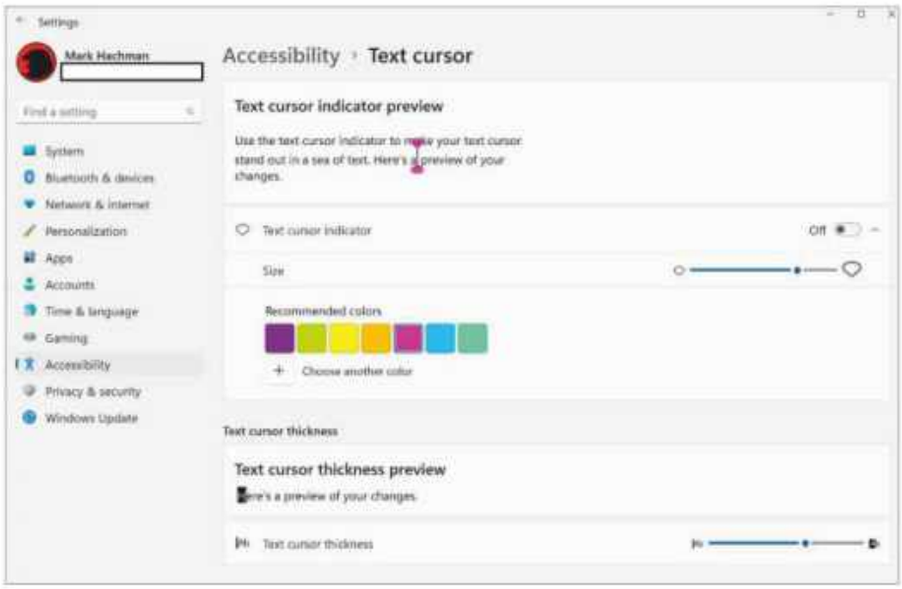
7. ADJUST WINDOWS' COLOR SCHEMES TO ACCOUNT FOR PROTANOPIA AND MORE

Various forms of what some call "color blindness" (trouble seeing red or green, for example, is referred to as protanopia or deuteranopia) can be accounted for within Windows. Go to the Windows 11 Settings menu (Accessibility > Color filters) and toggle the "color filters" to the on position. You'll then select what color filter works for you. (Toggle them on and off with **Win + Ctrl + C**).

Windows will then adjust the relative strength and shades of the Windows UI to make it easier for you to see.

8. TURN ON DARK MODE IN WINDOWS

Finally, there's the old standby. It's late, it's dark, and you don't want your display blasting out any more light than you have to. That's where dark mode comes into play.



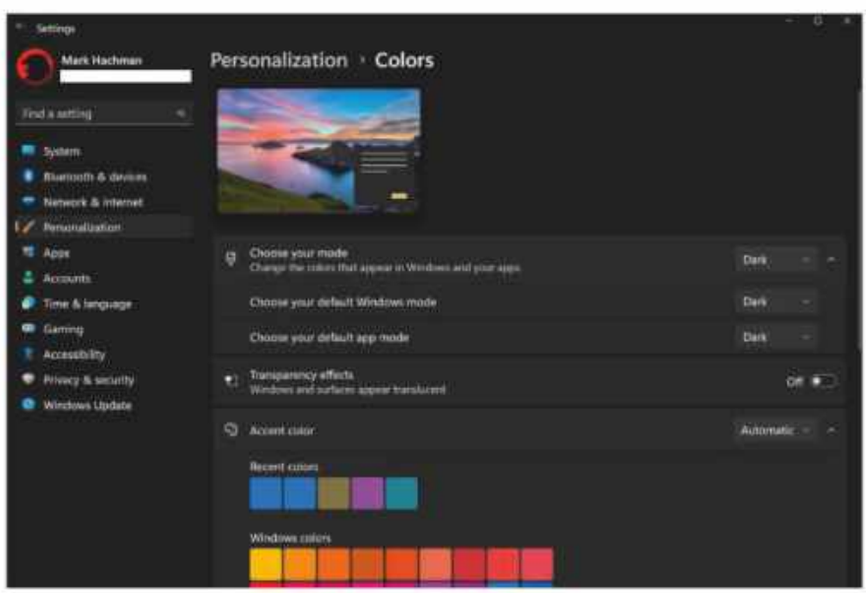
The Windows 11 text cursor indicator preview.

Within the Settings menu (Personalization > Colors), you'll have the choice of selecting the default Windows mode (light/dark), which can affect UI elements like your taskbar. Choosing your default app mode (light/dark) turns the background of certain Windows apps like Mail and Calendar dark, too.

That won't always affect apps like Microsoft Edge, which has its own settings. (In the upper right corner, click the vertical three dots, scroll down to Settings. On the next page, scroll down to Appearance). Here, you can specify whether Edge has its own settings or conforms to the Windows settings. You may find similar settings on other apps, too.

The idea behind all of these settings is that you need to find a setup that works best for you. Would you prefer to not wear bifocals while working, but you want to use a laptop screen and a desktop display? Configure the size and scale of the various elements accordingly. Having trouble distinguishing benchmark graphs because of their reliance on red and green? Color filters can help with that.

If only a new eyeglasses prescription was as quick and easy, right?



Remember, Windows 11 now allows you to configure light or dark mode for Windows as well as certain apps. You can access the additional controls by selecting Custom.

How to spot a scam email (and scam texts)

Don't fall for these telltale signs. **BY JOSH NOREM**

The fact that you and everyone you know will receive spam and scam emails (and texts) for as long as they live should be added to the famous Ben Franklin quote, "In this world nothing can be said to be certain, except death and taxes." Death, taxes, and spam. It's constant, ever present, and you likely have a few hundred of them sitting in your spam folder as you read this. The very fact that we even need to have a spam folder tells us there's a problem.

While email providers and the best Windows antivirus solutions (fave.co/3CnDHuk) can often do a decent job at spotting the false missives from Nigerian princes that hit your inbox, both remain far from foolproof—so you need to know how to

IMAGE: RAWPIXEL.COM/SHUTTERSTOCK

spot scam emails to avoid falling prey to their tactics. Here's some advice that can help.

ALWAYS KNOW (AND VERIFY) THE SENDER

An email from someone you know suddenly arriving in your inbox with no warning is a red flag. Typically, when we get email from our family or friends, it's about a topic we are actively discussing, so when there is no warning of an incoming email, tread lightly; it could be a scam. If there is a link inside a suspicious email, then it's almost always a scam. Hackers and ne'er-do-wells can sometimes take over someone's email account and just start spamming all of their contacts with nefarious links that seem safe but will plant malware on your system, or worse. Luckily, this tactic is easy to counter since you can just verify if the person who you think sent the email did indeed mean to send it. A simple phone call or text will do, and if they exclaim, "What email?" then you know what to do.

A list of scam email addresses in a message.

It's also important to point out that when examining these emails, don't just look at the name of the sender—check out the email address. For example, I got a spam email from "Facebook" recently, which is obviously fake, but when I clicked the drop-down for the actual address and CC'd people, I saw the details below. Even your *grandma* knows that is fishy. Not to mention the address, Facebookmail750@gmail.com—come on, spammers, try harder.

ALWAYS CHECK LINKS IN EMAIL

As a general rule it's safest to never click any links in emails, even if you think you know the source. As we just said, you might not actually know the source, and clicking links in email is how the vast majority of people fall victim to phishing operations (see the U.S. Presidential election of 2016 [fave.co/3Hyl4Ys] for how disastrous this can be).

That said, if you are sure of the source, and you are confident it is not a spam or scam email, you can always check the actual link prior to clicking it. The process is quite simple. Just hover your cursor over the link in the email, and a little window will pop up in the lower corner of your browser (usually on the left side) showing you the actual link. For

Hovering in the left corner will reveal where the link will take you.

Here's an example of a scam link.

example, when I hover over this masterfully written article's link on PCWorld.com (fave.co/3nrv6Cu), I can look in the lower left corner to see where it will take me. You might need to enable this preview window in your browser, so if you don't see link previews, click View in your browser's controls and look for something called Status Bar or similar.

When hovering over what you think might be spam links, you'll usually see some very strange URLs that are not typical, which usually means it's spam, of course. You can see an example at left.

SPELLING MISTAKES ARE A HUGE RED FLAG

Spelling mistakes, odd punctuation, and weird use of language are probably the easiest red flags to recognize. The majority of scam operations are run from countries far away, where English is not their native tongue, and hence you get such giveaways.

Sure, nobody is perfect and email can be seen as a casual way to communicate at times, so even *we* have typos in our emails from time to time. But if you're reading an email thinking the person must have been drunk while typing it, mark it as spam.

Hi Josh,

Though petfoodexpress.com, We think you will be interested in Dog Frisbee. They bring fun,health and interaction for dogs and their owners, so they will also bring you good revenue.

If interested,pls reply.

Regards,

Vicky.

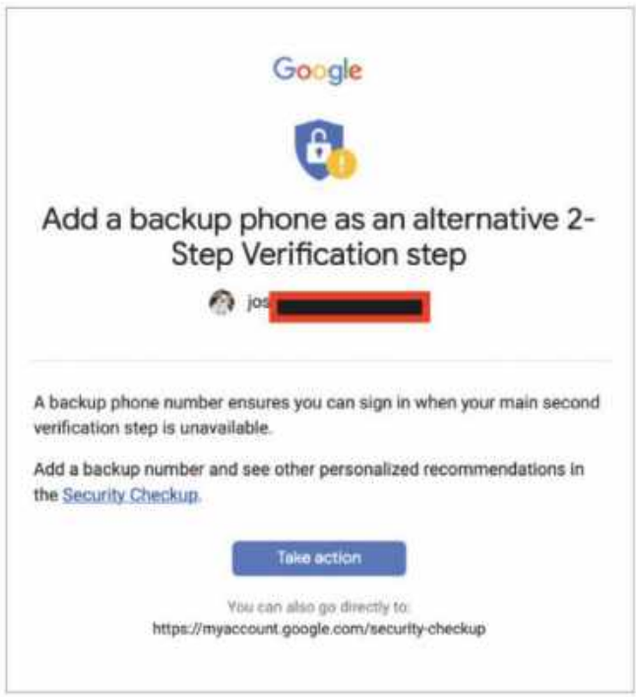
Keep an eye out for spelling mistakes.

BE WARY OF EMAIL FROM BIG COMPANIES

You will likely never receive an email from Facebook, Apple, or Google, unless you are paying for a service from them, so it could be an invoice for iCloud, Google Storage, or something similar. Usually they will not just email you out of the blue to let you know there's an issue with your account. They will, however, send you an email when a foreign device logs into your account, but hopefully that's you on a new device, and not some nefarious person. You should enable two-factor authentication on all your accounts (fave.co/41SY7rQ) for online services anyway, so something like this should not be possible in the first place.

That said, there are exceptions that can be safe. For example, I recently got an email from Google asking me to add a second phone number to my two-factor authentication setup, and since Google is usually smart about these things, it thoughtfully included a nonclickable link at the bottom if I wanted to copy and paste it myself instead of clicking an active link. That's because, as we've said previously, savvy users know to be wary of clickable links. Most big companies will also tell you in their emails that they will never ask for your password over email.

One more thing to note: Typically, if you do get an email from a big company like Facebook, there will not be clickable links in the email. It'll be just to inform you of something. However, if you are curious enough to follow up, do it outside the email itself. Open Facebook, or your Google settings, or your iPhone, and investigate the issue there instead of through the email you received.



Google lets you add a second number to your 2FA setup.

TEXTS ARE JUST AS DANGEROUS AS EMAIL

I'll admit it, I have definitely been curious about a few texts I have received, which were worded like, "Your Amazon package is delayed. Check its status here." Most of us have an Amazon package en route often enough for this type of message to be applicable, but more often than not, it's a scam.

Text messages are much more dangerous than emails because there's not really a way to

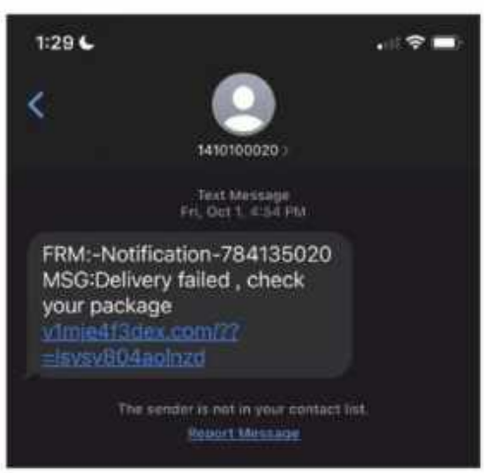
see where the embedded link is taking you unless you preview it, but not everyone knows how to do that. Smartphones have gotten smarter by displaying a preview of what is linked in a box with an image, but of course the scammers have found ways around this, so there's usually not a preview box. The best thing to do, in almost every case, is simply ignore the text, block the sender, and navigate directly to the website of the alleged link. If that example Amazon package was indeed delayed, you'll find evidence of it in your orders summary on Amazon.com.

In the link above, you know it's a scam just based on the URL alone, but what if the message is more sophisticated than that? What if they use your name, or say something in the message that is actually applicable to your life?

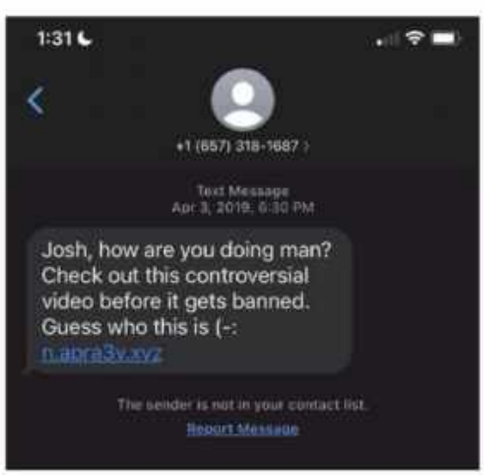
The same rules apply to texts as to emails—if you don't know the sender, do not open any links. Even if you know the sender, contact them separately to verify they are in fact the ones who sent it. Either way, your life will not deteriorate in any noticeable fashion if you simply do not click the link provided.

STAY VIGILANT, DON'T CLICK, STAY SAFE

To sum things up, the best Windows antivirus tools (fave.co/3CnDHuk) can often spot a lot of scam emails for you, and the vast majority of phishing and malware attacks are only successful if the target clicks on a link provided. While there are "no click" malware attacks going around right now, they are expensive for a third party to purchase on the black market, so they usually target high-level government employees, journalists investigating corruption, and those types of people. Most regular people will only get scammed if you respond to a mysterious message, whether it's via email or text. So be safe and do not click on links you get that seem fishy, no matter how curious you might be about them.



There's not normally a way to preview links in texts.



If you don't know the sender, do not open any links.

Tech Spotlight

A video showcase of the latest trends

Gordon Checks Out iFixit's Repair Business Toolkit

iFixit's biggest and most bombastic gadget repair kit costs $300, but it can help you fix almost anything. Watch Gordon Mah Ung check out every piece!