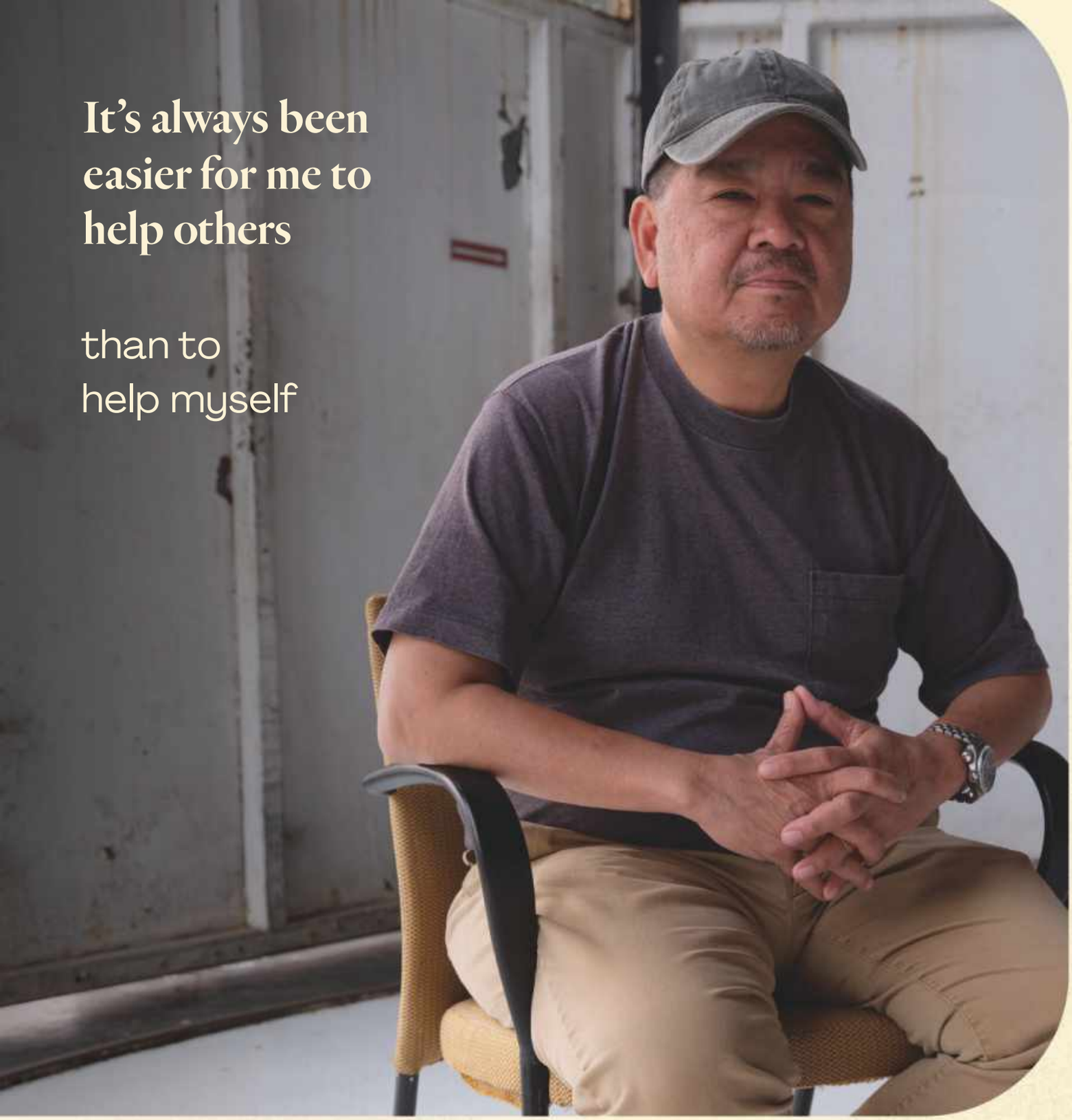
WINDOWS 11 2023 UPDATE REVIEW: RISE OF THE AI PC

PCWorld

DECEMBER 2023

10 MUST-KNOW SECURITY TIPS TO STAY SAFE ONLINE

CPU BLITZ! INTEL 14TH-GEN, THREADRIPPER RETURNS, SNAPDRAGON X ELITE



As a Veteran, when someone raises their hand for help, you're often one of the first ones to respond. But it's also okay to get help for yourself. Maybe you want or need assistance with employment, stress, finances, mental health or finding the right resources. No matter what it is, you earned it. And there's no better time than right now to ask for it. **Don't wait. Reach out.**

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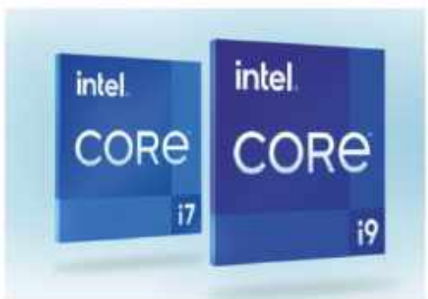

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COVER IMAGE BY MARYNOVA / SHUTTERSTOCK

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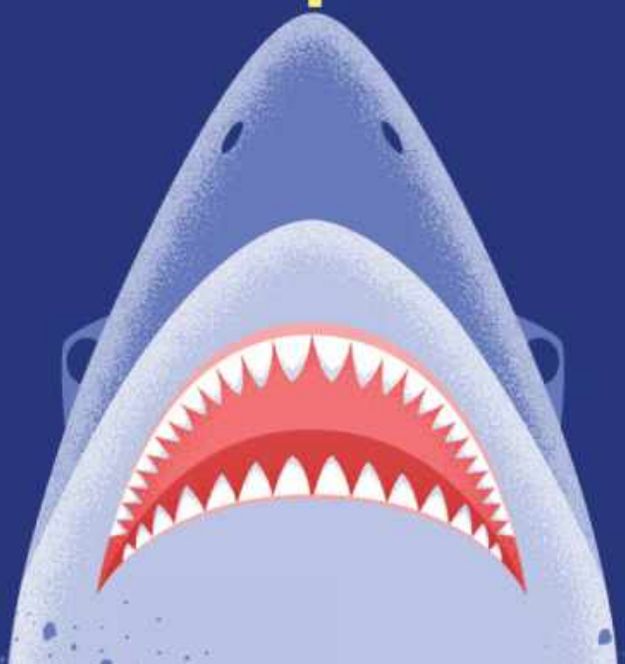

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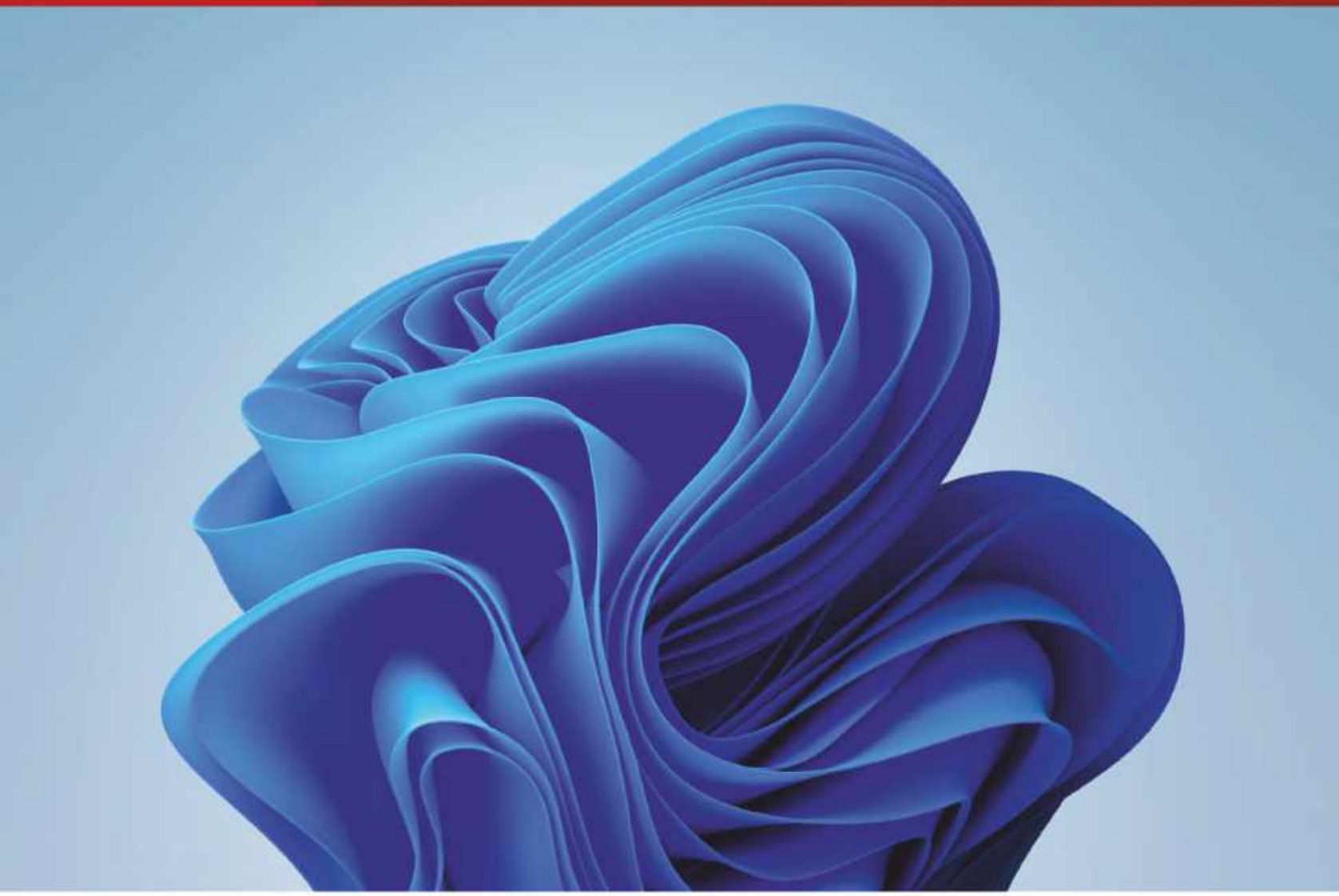


Windows 11's huge 2023 Update is available now: Here's what's new

Microsoft has announced the general availability of the Windows 11 2023 update.

BY PANAGIOTIS KOLOKYTHAS

Mere days after Microsoft released the Moment 4 Update for Windows 11 users (fave.co/3FRjzVz), adding numerous new features and improvements to Windows 11 version 22H2, the company also unleashed the huge annual Windows 11 2023 Update (also known as Windows 11 version 23H2).

"Because Windows 11, version 23H2 shares the same code base and servicing branch as Windows 11, version 22H2, this feature update will be delivered via Windows Update (as with the monthly

IMAGE: MICROSOFT

update process) to enable a quick installation," Microsoft explained.

WINDOWS 11 22H2 MOMENT 4 UPDATE VERSUS WINDOWS 11 23H2

Somewhat confusingly, Windows 11 users will receive most of the new features of Windows 11 version 23H2 with the Moment 4 Update for Windows 11 version 22H2, which is already available as a preview update via KB5031455. To install it, the option "Get the latest updates as soon as they are available" must be activated in the Windows Update settings.

The Moment 4 update was delivered to all Windows 11 users on "Patch Tuesday" on November 14. Over the next few weeks, there will then be another, smaller update that will increase the version number of Windows 11 from Windows 11 version 22H2 to Windows 11 version 23H2 and add a handful of other features.

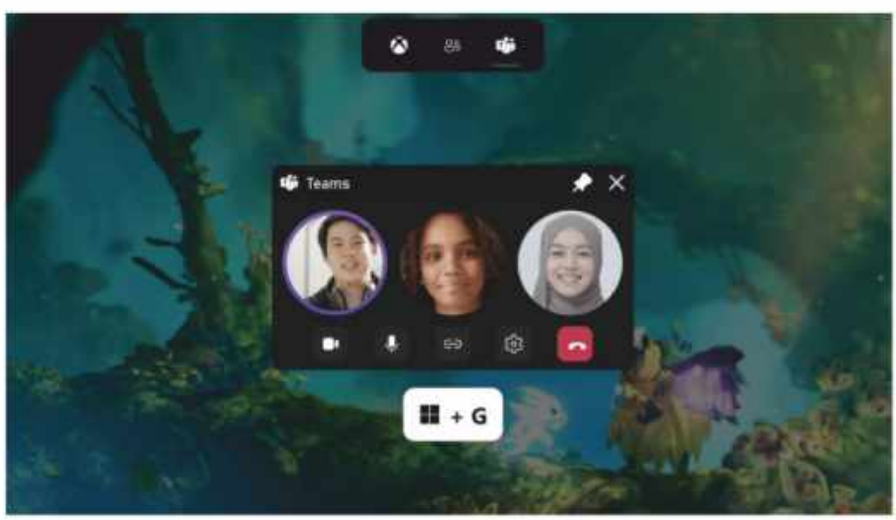
Microsoft didn't reveal when the 2023 Update will be delivered to all Windows 11 users worldwide. Experience shows that it should take several weeks, if not months, until it's pushed to every PC. OEM manufacturers will be the first to receive the new Windows 11 version in order to install it on the PCs and laptops they manufacture.

Microsoft will *not* deliver the 23H2 update if your system is still incompatible with some of the new or changed features—for example, because a hardware driver or an installed app still requires adjustments on the part of the manufacturer. Only when these problems have been solved will the system receive the 23H2 update via Windows Update.

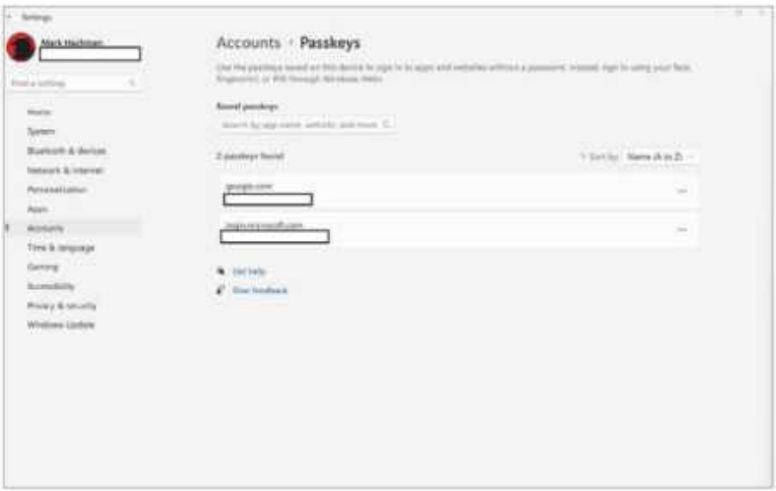
WHAT'S NEW IN WINDOWS 11'S 2023 UPDATE

In addition to the flood of Moment 4 features, Windows 11 version 23H2 comes with some new enhancements. According to Microsoft, this means, for one thing, that instead of Chat, "Microsoft Teams (free)" will be pinned to the taskbar (fave.co/3QQmCDE) in future.

Under All Apps in the Start menu, all system components of Windows 11 are labeled System.



Microsoft Teams now connects to the Windows Game Bar as well.



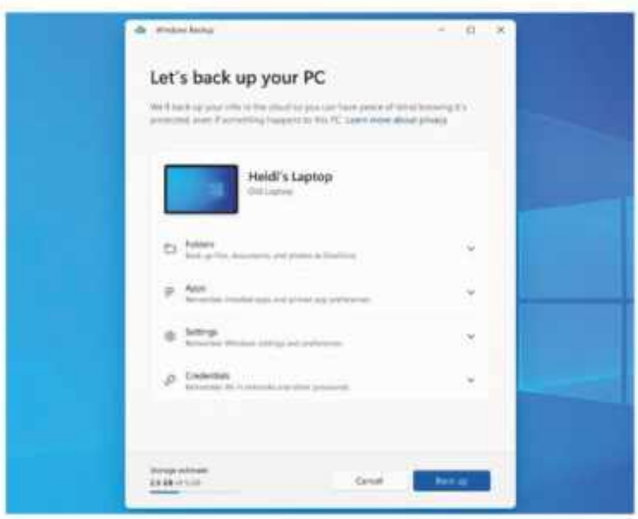
Passkeys are debuting in Windows 11.

Windows 11's 2023 Update also includes a sensible tweak that can help you stay organized: In Settings > Apps > Installed Apps, only applications and games installed by you will be shown. Any components installed and required by Windows 11 will be split out to Settings > System > System Components.

MOMENT 4 INNOVATIONS AND IMPROVEMENTS

The Moment 4 update that makes up most of the Windows 11 2023 Update is the most extensive update since the release of Windows 11. A look at this support article from Microsoft (fave.co/3QR66T1) shows how extensive the update is, where all the highlights are listed separately according to categories such as Start Menu, Taskbar, File Explorer, Security, and Settings and Bluetooth. These highlights include, for example, the following:

- Native support for the rar, 7z, and tar pack formats (fave.co/3u9mQx7)
- Improvements in the start menu
- A beefed-up volume mixer that can be called up via Ctrl + Windows + V
- Catalogs in the file explorer
- The new Windows Backup app
- Support for passkeys (which are supposed to replace passwords)
- Extended phishing protection
- The possibility of hiding the display of the time in the bottom right corner
- A completely revised start page for Settings
- The control of devices with dynamic lighting (such as mice, keyboards, and so on)
- And much more.



The latest Windows 11 update introduces a new Backup app.

Don't click Google ads for software downloads. They're dangerous

Malvertising never goes away—it just changes tactics. **BY ALAINA YEE**

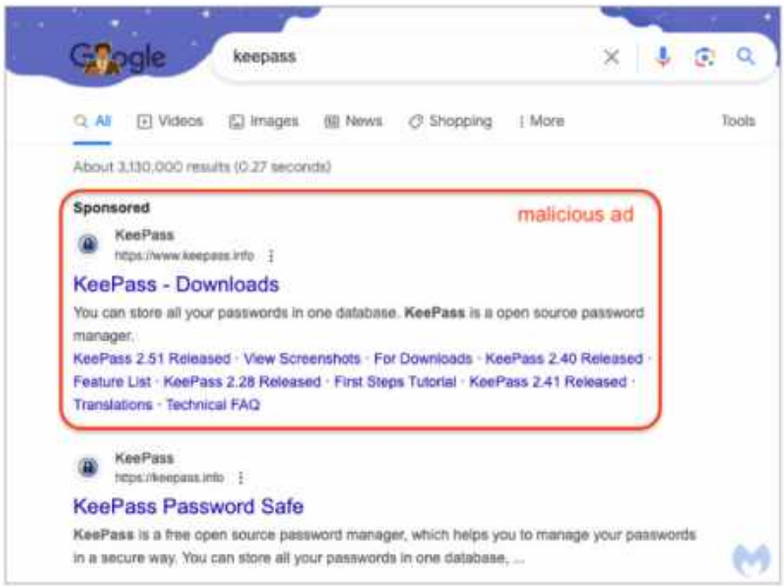
Clicking on a Google ad can be like gambling, except that there are no winners in the game. Land on a legitimate website, and you've fed the algorithm info about what ads to keep serving you. End up on a malicious webpage, and—well, you may have exposed your PC to danger…especially if you downloaded software from the phony site.

We've issued this warning before, like when owners of AMD Radeon graphics cards (fave.co/3ssdNqo) were targets. Or when the crosshairs moved over to Bitwarden users (fave.co/4690wB1). Now Malwarebytes, a well-known maker of anti-malware software, is reminding us to keep avoiding ads in search results. As reported by Bleeping Computer (fave.co/49vxMoU), the company has discovered a new trend—using unicode characters to make fake web addresses look real.

Called homograph attacks, this tactic has been around for a while. What's newer is its

IMAGE: SOLARSEVEN/SHUTTERSTOCK

use in Google ads. Malwarebytes spotted this approach (fave.co/47h43hw) in a sponsored ad for KeePass (fave.co/3NoB6ZU), a free password manager typically used by geekier tech enthusiasts. Its target audience is generally pretty savvy and able to pick up on clues that a link could be suspect. But for this particular sponsored ad, the URL in the search result looks just like the real address—with no other indicators that the site is fraudulent.



Malwarebytes spotted this fake Google ad for KeePass—which has a URL that looks just like the real website.

If you were in a hurry and clicked the link, you could miss the deception. The sham website looks exactly the same as the real deal, except its software download is full of malware. The only tip-off is the address bar, which uses the unicode character "Ä·" in place of the letter "k." It's a subtle difference, and one easily overlooked.

You can get full technical details of how this malvertising trick works in Bleeping Computer's rundown, but the main takeaway is the same as before: Don't click Google ads for software downloads. That may sound easier said than done, what with the sponsored ones appearing at the top of search results, but it's doable if you try these tips:

- Scroll down the list of results. Text ads for legit companies will appear again as normal search results, often within the top five. Use the link that's further down the page.
- Check for an ad label.
- Slow down. Take an extra few seconds to look over your search results.
- If you can't see the full URL, hover your cursor over the text link, and it'll appear at the very bottom left of your browser tab.
- Use antivirus or antimalware software (fave.co/3CnDHuk) that will block your ability to load phony sites.

The nuclear option, of course, is to use ad-blocking extension for your browser, like uBlock Origin (fave.co/4690Mjt). Unfortunately, you can't get away from the evolving attempts to compromise your PC—not even by switching search engines. Microsoft Bing also has similar issues. The best you can do is to keep as much distance between yourself and bad links—and report them if you see any.

Qualcomm's Snapdragon X Elite chips promise major PC performance

Qualcomm's Nuvia chips return to the PC in 2024 in a big way with the Snapdragon X Elite platform. **BY MARK HACHMAN**

Qualcomm and its Snapdragon chips are officially back inside the PC. Today, Qualcomm formally launched the Snapdragon X Elite, the flagship platform of its Snapdragon X family that leverages its Oryon CPU core, and promises to *double* the performance of some of the most popular 13th-gen Core chips from AMD and Intel.

Sound familiar? It should. Qualcomm promised the same with its earlier Snapdragon 8-series chips, and really didn't deliver. But after buying chip designer Nuvia in 2021 (fave.co/3pWUvUH), Qualcomm is trying again, hoping that its superpowered Arm chips can once again make Windows on Arm PCs a competitor to conventional X86 PCs when they launch in mid-2024. And it's talking up some big numbers to prove it.

Qualcomm sees Oryon first going into PCs (as the engine of the Snapdragon X Elite

IMAGE: QUALCOMM

platform) but then moving into smartphones, cars, "extended reality" devices, and more. Qualcomm chief executive Cristiano Amon said that Qualcomm is becoming a "connected processing" company, a theme he's mentioned before.

POWERING UP THE PC WITH PROCESSING, AI

If there's one trend Qualcomm is clearly among the leaders in, though, it's AI. Qualcomm has offered intelligent processing from camera smartphone mode up through more sophisticated audio and video filtering, and is well positioned if and when generative AI or other technologies arrive on the PC.

"We look at AI everywhere," Amon said. AI can work in the cloud or as hybrid AI: a combination of cloud AI and local processing.

Whether or not it will keep up with AMD and Intel in overall PC processing, though, is the more important question. Qualcomm spent considerable time and effort at the Snapdragon Summit in Maui last October to try to convince reporters and analysts that it can—and talked in some detail about what the Snapdragon X Elite offers in terms of architecture and performance.

According to Peter Burns, senior director of product marketing for Qualcomm, the company is on a mission to "modernize the PC experience" with a "premium SOC designed to revolutionize Windows PCs."

"This is performance reborn for the PC ecosystem," Burns added. "X Elite is the most powerful, intelligent, and efficient processor for Windows in its class."

Qualcomm also disclosed its Snapdragon 8 Gen 3 processor for smartphones at its technology summit. Our colleagues at TechAdvisor (fave.co/3YzEqFx) covered that.

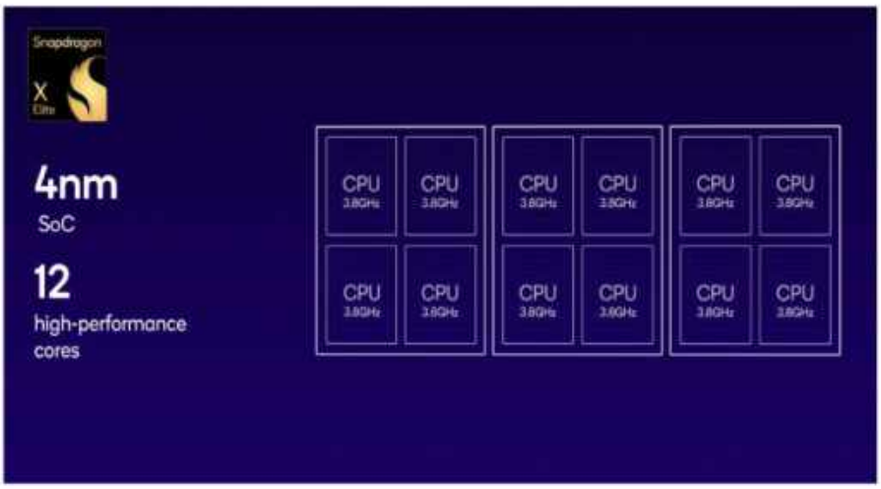
MEET QUALCOMM'S ORYON CPU, THE HEART OF THE SNAPDRAGON X ELITE

"I have to tell we have exceeded our own expectations," Amon said. "It is the new leader in mobile computing, period."

The attention paid to the Snapdragon X Elite is focused on Qualcomm's Oryon CPU, and for good reason. After originally pledging to sample in 2022 (fave.co/40tmM7j) with PCs shipping in 2023, Qualcomm then pushed its schedule out by a year, saying it would ship Oryon in 2023 (fave.co/3shd2AA). That's potentially still the case, even with Oryon PCs (now using the Snapdragon X Elite platform brand) hitting shelves in 2023.

To begin with, Qualcomm's Snapdragon X Elite is manufactured on a 4nm process node, versus the Intel 4 process node of Intel's Meteor Lake. (The two process technologies aren't directly comparable, though they're close enough for most purposes.)

Oryon is a tri-cluster design. Historically,



Qualcomm's Snapdragon X Elite has a familiar design.

that has meant prime, performance, and efficiency cores, with each type of core taking on their own role depending upon the task. However, it appears that Qualcomm and its X86 rivals may have swapped strategies; as Intel adopts performance and efficiency cores, Qualcomm has chosen AMD's path. There are 12 cores within the Snapdragon X Elite, all running at 3.8GHz—well, most of the time. If needed, one or two of the cores can boost itself to 4.3GHz, the turbo boost strategy that's become common on the PC.

The 64-bit Oryon CPU will be paired with 42Mbytes of total cache, as well as a memory controller that can access eight channels of LPDDR5x memory (64GB in total) with 130GBps memory bandwidth, executives said. It will be a single die, not a chiplet design.

Qualcomm isn't saying too much about the new Adreno GPU, only that it can deliver 4.6 teraflops. It will power an internal display up to 4K resolution and 120Hz, with HDR10 capabilities. However, the chip can drive three UHD/4K displays or dual 5K displays via embedded DisplayPort 1.4, Burns said. It's also Qualcomm's first desktop chip to feature upgradable software drivers, a staple of PC graphics.

The Adreno engine will also be able to encode at 4K60 in H.264, HEVC and AV1, and to decode at 4K120 in all three, plus VP9.

The Snapdragon X Elite platform will also ship with 5G capabilities via the discrete 10Gbps Snapdragon X65 modem, Wi-Fi 7 (fave.co/3rPd820), Qualcomm's lossless audio technology, and Microsoft Pluton (fave.co/3v6Ypi5), a security technology that AMD has also adopted, but not Intel (fave.co/3T4dWZ4). It will be able to access NVMe SSDs using PCIe Gen 4, though Qualcomm hasn't said how many lanes will be available. The platform will also provide three USB4 connection, with two 10Gbps USB-C connections.

FOR QUALCOMM, PERFORMANCE IS EVERYTHING

Here's the statement, though, that's going to be the key point. "Snapdragon X Elite delivers up to two times the performance compared

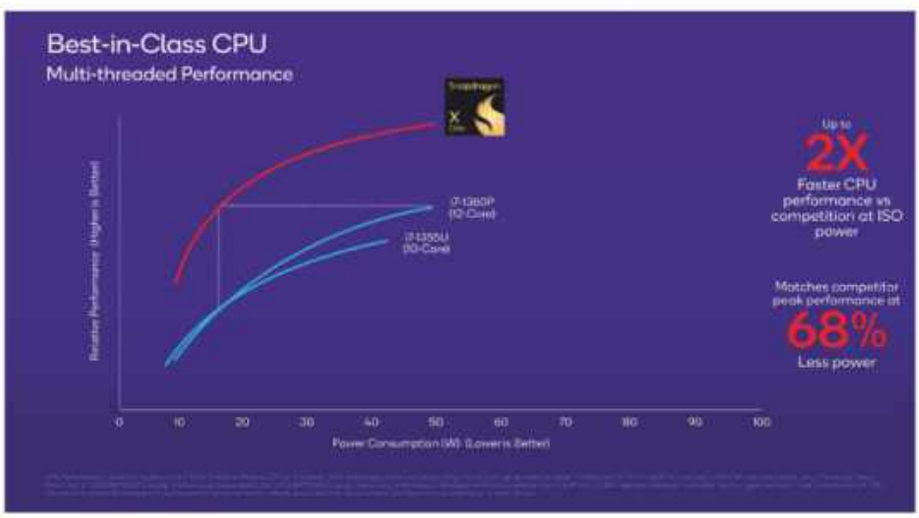
Qualcomm is taking aim at Apple with the Qualcomm Snapdragon X Elite chip and its Oryon CPU.

to our competitors' most widely adopted 10- and 12-core laptop CPUs," Burns said. "And it can match their peak performance with as little as one-third of the power for incredible battery life."

Burns clarified that the power reference was for a "leading 14-core laptop competitor." Burns also said that the Snapdragon X Elite will deliver better peak multithreaded performance than its nearest Arm-based competitor. Here, Qualcomm is claiming that the Snapdragon X Elite will beat Apple's M2 Max in single-threaded performance and will match its peak performance at 30 percent less power.

But which chips is Qualcomm talking about? Burns didn't say, but a Qualcomm representative offered a clarification: Qualcomm is comparing its chips against the 13th-gen Core chips, Raptor Lake.

Specifically, Qualcomm is saying that the Oryon CPU inside the Snapdragon X Elite is up to twice as fast as the Intel Core i7-1355U, and also bringing in Intel's 12-core chip, the Core i7-1360P. The 14-core Core chip Qualcomm is comparing the Snapdragon X Elite to? The Core i7-13800H.



Qualcomm is claiming that its Snapdragon X Elite PC platform and the Oryon CPU will deliver more performance than Intel's current best.

And yes, Qualcomm believes its Snapdragon X Elite and the Oryon can take on Intel's best.

If you read the *tiny* print on each of Qualcomm's slides, you'll see that Qualcomm is using the multithreaded version of GeekBench 6.1 as a point of comparison. Qualcomm is also claiming that the Oryon will beat a Core i9-13980HX in single-threaded performance, too, at 70 percent less power than the Core i9-13980HX consumes at peak performance.

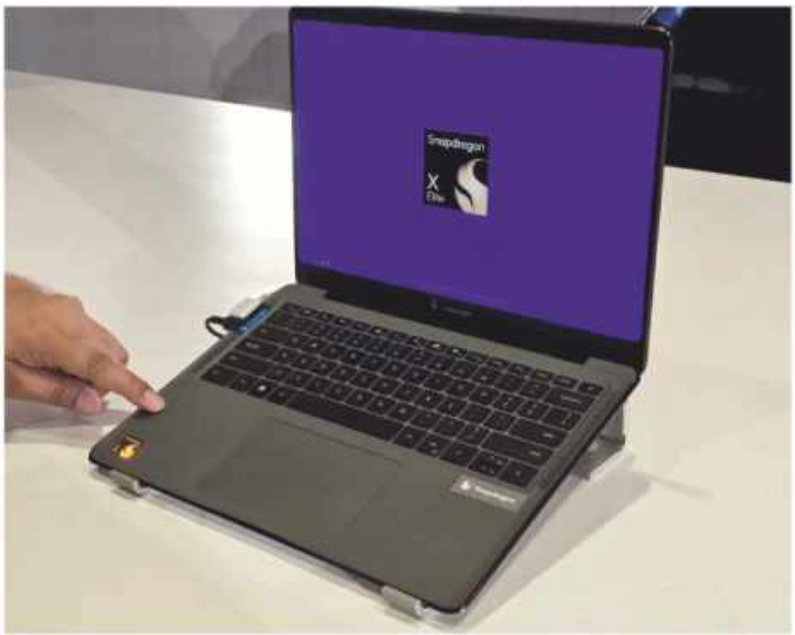
Qualcomm also believes that its integrated Adreno GPU will deliver "up to 2 times faster GPU performance versus competition," or match the competition's performance at a quarter of the power.

This matters, though. As most people know, the selling point for a Qualcomm PC has been its connectivity and battery life, with performance and application compatibility proving to be two black marks against the platform. In 2019, for example, Qualcomm told reporters at Computex that its Snapdragon 8cx chip would outperform an 8th-gen "Kaby Lake-R" Core (fave.co/3uhkjk8) chip, based upon (fave.co/3StXsw1) the PCMark 10 Apps benchmark. But PCWorld's benchmarks of the chip inside the

GPU performance has typically been a Snapdragon strong suit, but the world has become more competitive. So, apparently, has Qualcomm.

Samsung Galaxy Book S (fave.co/3ssfyE0) revealed that the Core i5-8250U, a Kaby Lake-R chip, outperformed the Snapdragon 8cx by over 50 percent on Qualcomm's hand-picked benchmark. That means Qualcomm needs to show some compelling numbers, and ones that hold up.

Right now, Qualcomm is only disclosing the single Snapdragon X Elite platform. But Burns seemed to imply a range of chips is coming.



One of the Qualcomm Snapdragon X Elite reference designs.

"You can take this one chip and scale it across a broad range of thermal designs," Burns said. "So it's a huge benefit to our OEM partners because it simplifies the process to create laptops across so many different form factors.…You get more modern devices while getting leading power-performance whether you're using a two-in-one, an ultraportable, all the way up to laptops with large displays."

Gerard Williams, senior vice president of engineering for Qualcomm, said future Oryon CPUs will improve power and performance for many CPU generations to come.

THREE SNAPDRAGON X ELITE REFERENCE DESIGNS

At the Snapdragon Technology Summit, Qualcomm won a commitment from Lenovo to use Oryon inside commercial and consumer PCs. HP also appeared on stage to endorse the platform, as did Microsoft. All three have used Qualcomm Snapdragon chips before.

While we don't know if any of these companies will make Snapdragon X Elite laptops, Qualcomm showed off three unlabeled reference designs at the show.

POSITIONED FOR AI—IF AND WHEN IT HAPPENS

AI, though, remains a challenge for Qualcomm as much as it matters for its rivals. Intel, which has invested in an NPU for its 14th-gen mobile Meteor Lake chip, doesn't have an obvious candidate app for local AI besides Stable Diffusion's AI art (fave.co/3kzk7rZ), and has launched an AI acceleration program (fave.co/3FQsSVF) to try to jump-start local AI software

18+

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development. Like Intel, Qualcomm is making the argument that AI on the PC needs to be fast, personalized and private.

In 2023, Qualcomm and Meta agreed to work together to take Meta's Llama AI engine and run it on Snapdragon chips. Llama (you can try a cloud-based version of Llama: fave.co/476xmDF) is an AI chatbot like Bard or Bing Chat. Llama's 13 billion parameters can run on top of the Snapdragon X Elite, or Qualcomm can run a smaller model, with 7 billion parameters, at 30 tokens per second on a Snapdragon X Elite PC. Essentially—since AI parses words and their relationships, then generates a response—30 tokens per second is about one to two sentences per second, according to OpenAI (fave.co/3MAmNkf). The key is that's all being processed on your PC, without the need to disclose your question, or your identity, to the cloud.

One number that Qualcomm is talking about is the relative performance of its Hexagon NPU, or AI engine, in terms of trillions of operations per second, or TOPS. It's a number that Intel has alluded to but never quite specified. ("I'm going to deliver billions of TOPS that developers can design to," Michelle Johnston Holthaus, an Intel executive vice president and general manager of Intel's Client Computing Group, said recently; fave.co/3SxDnEY.)

Qualcomm's putting a stake in the ground. Burns said that the Snapdragon X Elite generates 45 TOPS, over 4.5 times what PC laptop competitors offer today. That, in part, comes from an improved power delivery system, twice the shared memory, and a tensor accelerator that runs 2.5 times faster. It will work in conjunction with what Qualcomm calls its Sensing Hub, a sensor array that will always be on and active for things like presence detection.

Combine the NPU, GPU, and CPU, and the TOPS performance soars to 75 TOPS, Alex Katouzian, general manager and senior vice president in charge of compute, XR and mobile, said.

On AI, Qualcomm is working with Microsoft, Meta, Google, HP, and others, Qualcomm said. Models that can run on Snapdragon include OpenAI's Whisper, Baidu's Ernie 3.5E, and more.

The Snapdragon X Elite generates 45 TOPS, over 4.5 times what PC laptop competitors offer today.

The question still remains: What are you supposed to do with AI on the PC? There's not a great answer for that right now, but Qualcomm will undoubtedly let it be known over time.

SNAPDRAGON SEAMLESS

Move over, Intel Unison (fave.co/40rV7SZ). Qualcomm also has a technology framework to connect your phone, laptop, and watch—and soon your car and AR devices, too. Called Snapdragon Seamless, the technology is designed to allow devices to work together, but also to allow peripherals to carry over from one platform to another. According to Cisco Cheng, senior director of product marketing for Qualcomm, each device will communicate its status to others, including battery life, Wi-Fi strength, and more.

Cheng said that Qualcomm will show off features normally associated with Unison or Windows' own Your Phone app (fave.co/3ITafHM), but also will offer some new tricks: the ability to push a cursor across multiple devices (which, to be fair, Samsung has already shown with Samsung Flow, fave.co/3MzNbdX) or even to stretch an app across multiple devices. Smartphones could connect to the Web and project images to an XR device. Earbuds could follow you from one device to another.

Snapdragon Seamless is another cross-device, cross-platform framework, but it might be truly better.

Qualcomm's Cheng said his company is working with Microsoft, Google, Asus, Lenovo, Oppo, and Honor to bring together multi-device ecosystems. (Expect to see partnerships with the Chinese mobile device makers first, with Dell and Lenovo coming later, Cheng said.) Seamless will, however, require Qualcomm's "latest platforms," presumably the Snapdragon X Elite and the Snapdragon 8 Gen 3 mobile processor.

"I want to reiterate that we are not replacing the solutions that already exist out there," Cheng said. "But instead we are working behind the scenes to help bridge the divide between these multiple devices."

Let's face it: Qualcomm has a lot to prove on the PC. In the near future, we'll begin to see if it can live up to its own lofty expectations, as well as the world's.

Windows Copilot AI is the new Start button, says Microsoft CEO

Could Windows 12 replace the Start button with Copilot? **BY MARK HACHMAN**

We may not know how Microsoft will redesign Windows 12, but we do know how Microsoft is thinking about it: The company is putting AI first, to the point where Windows Copilot could be the new Start button.

During the announcement of the rather shocking performance claims surrounding Qualcomm's Snapdragon X Elite and its Oryon CPU (fave.co/40topBX), Qualcomm CEO Cristiano Amon sat down for a pre-recorded video chat with Microsoft CEO Satya Nadella. The two have worked closely together to enable Windows on Arm to run on Snapdragon-powered PCs, and now to spur the creation of software that takes advantage of the integration of neural processing units (NPUs) into modern computers.

For Nadella and Microsoft, the centerpiece of AI is Copilot, which either runs on Windows or in various apps like Microsoft 365. "And so in some sense,

IMAGE: AVEL CHUKLANOV / UNSPLASH

there is a new generation of AI PCs that I think are getting created," Nadella said. "So the work we're doing together, you know, it's sort of going to bring together these experiences that cannot be done without sort of a new system architecture."

Nadella didn't have the time to spell out what he meant here, but it's possible that he was talking about the next Windows iteration, which would logically be called Windows 12 (fave.co/40uGMXg). So far, the only reports we've had is that it could be very modular—and, with all of the work Microsoft has done on AI, heavily tilted toward Microsoft's AI technologies.

And that's what Satya Nadella talked about next.

"The Copilot is like the Start button," Nadella said. "It becomes the orchestrator of all your app experiences. So, for example, I just go there and express my intent and it either navigates me to an application or it brings the application to the Copilot, so it helps me learn, query, and create—and completely changes, I think, the user habits."

That's a fairly telling statement. We know that people will "search" for websites that they already know, simply using the URL bar in a Web browser like Google Chrome or Microsoft Edge as a navigational tool. So, too, do people search within Windows for a given app, rather than finding it in the Start menu.

Nadella seems to think that users will do the same with Copilot—but maybe they won't even ask it to open an app. The notion of "intent" leaves open the possibility that a user is searching for an app, or simply is asking for something like "a way to edit a photo" or "help me with financial planning." Maybe Copilot is a way to launch apps. Maybe it's a way to suggest apps.

Either way, Nadella seems to think that Copilot is a richer way of asking Windows to help you do what you want to do, rather than searching for a list of apps. Could it replace the iconic Windows Start button some day? We'll see what the future holds.

Microsoft's Satya Nadella has said that "Copilot is like the Start button."

AMD's monstrous Threadripper 7000 CPUs aim for desktop PC dominance

AMD's Zen 4 architecture merges with Threadripper's massive core counts to create perhaps the most powerful PC processor ever. **BY MARK HACHMAN**

AMD's powerhouse Threadripper chips are back for desktop PCs! Despite declaring the end of consumer Threadripper chips (fave.co/3Qvcy1x) *last* generation, AMD has announced three new Ryzen Threadripper 7000-series chips, with up to 64 cores and 128 threads—and the option of installing a Pro-class Threadripper 700 WX series for a massive 96 cores and 192 threads, too.

Take a deep breath, though. The underlying message is the same as when AMD released the Threadripper 3970X back in 2019 (fave.co/3uegbkW): These chips are for those who live and breathe video editing and content creation, and are optimized for such. Nevertheless, they almost certainly represent the most powerful CPU you can buy on a desktop, and they'll cost a ton.

IMAGE: AMD

The key differences between the older workstation-class Threadripper 5000 series (fave.co/3ID9JY5) and these new 7000-class processors are simple: AMD has brought forward its Zen 4 architecture into Threadripper alongside a higher core count, faster boost frequencies, and a generational leap ahead to PCI Express 5.0. Consumers will need new motherboards, though, as the new TRX50 consumer Threadripper platform uses the new AMD TRX50 HEDT (high-end desktop) chipset and sTR5 socket. And did we mention that they consume (gulp) 350W of power?

AMD's new Threadripper 7000 series.

In some ways, though, the new Threadripper 7980X, 7970X, and 7960X consumer Threadripper offerings are familiar. They stick with AMD's tried-and-true 64-core configuration, the same as the Threadripper 5000 series, moving down to 24 cores. The 12- and 16-core configurations have been trimmed off from the prior generation.

"We had thought we could give the market the coverage it needed, just by simplifying it down to a single platform," said Donny Woligroski, senior marketing manager for consumer processors at AMD. "There was a lot of feedback from consumers who needed specific solutions, and a lot from just fans who wanted access to a high-end desktop platform. We heard you; we are bringing it back. It's as simple as that."

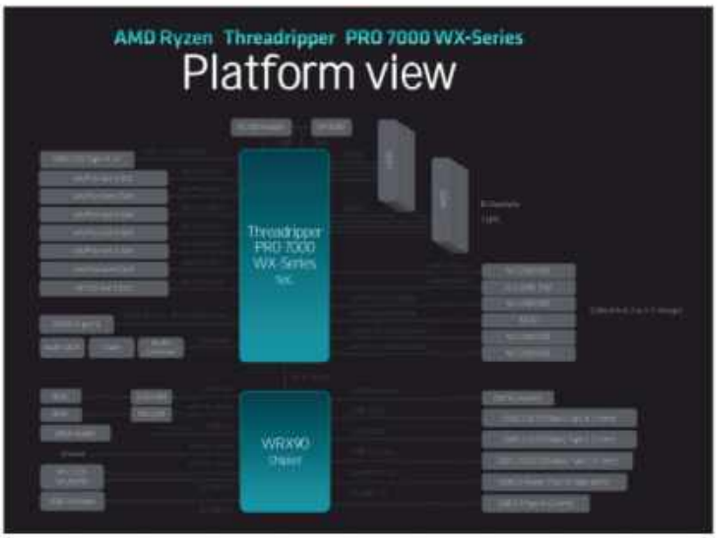
Here are the configurations of the new chips, which are available to buy as of Nov. 21. Note that AMD disclosed the prices of its new Threadripper chips at press time—you may need to consider delaying your rent or mortgage for a month to cover the costs.

AMD Ryzen Threadripper 7980X: 64 cores/128 threads, 3.2GHz base/5.1GHz boost, 256MB L3 cache, 320MB cache total; $4,999

AMD Ryzen Threadripper 7970X: 32 cores/64 threads, 4.0GHz base/5.3GHz boost, 128MB L3 cache, 160MB cache total; $2,499

AMD Ryzen Threadripper 7960X: 24 cores/48 threads, 4.2GHz base/5.3GHz boost, 128MB L3 cache, 152MB cache total; $1,499

All of these new consumer-class Threadrippers 7000 processors consume



The platform view of the Threadripper Pro family. (AMD did not provide a corresponding view of the consumer platform, but they're very similar.)

350W and allow for overclocking. (OEM systems probably won't allow overclocking, AMD executives said.) They also include 4 channels of DDR5 RDIMM memory with error checking and 48 lanes of PCI Express 5.0 I/O. (A total of 88 usable PCIe lanes, including PCIe 3, appear on the platform.) The four channels of memory are significant, as AMD's previous Threadripper offerings provided eight, probably overkill for a consumer design.

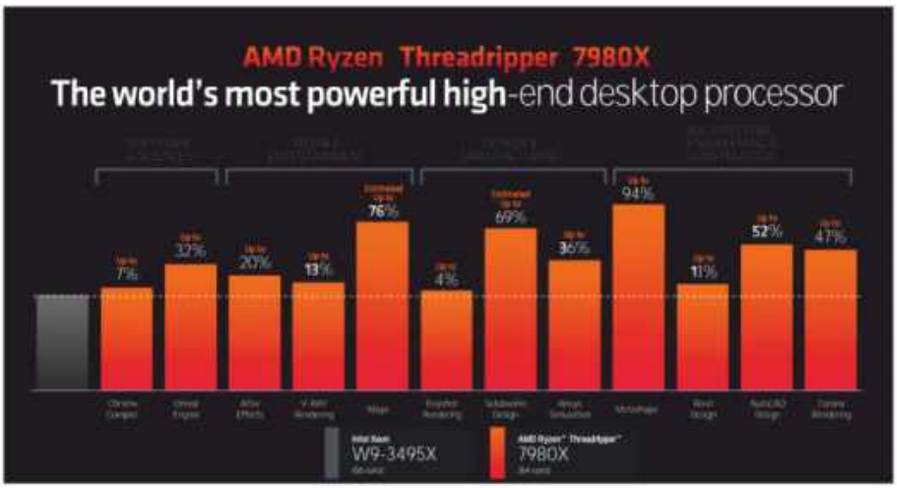
The new Threadripper platform tweaks the older design. The Threadripper 5000 platform collected eight cores within a single CCD, sharing 32MB of cache, with a total of up to eight CCDs (for 64 total cores). The Threadripper 7000 platform maintains the eight-cores-per-CCD design, but increases the shared cache to 32MB per CCD. The increased number of cores also necessitated more CCDs: up to 12 in all with the Pro chips (for 96 total cores). AMD's Infinity Fabric Gen 3 helps tie them all together.

Interestingly, AMD's new Threadripper Pro lineup uses the same sTR5 socket as the desktop models, though the Pro lineup is flexible: Those chips can either use what AMD calls the Pro platform, or use the HEDT platform. A deep-pocketed enthusiast could conceivably buy one of the new four Threadripper Pro models for use in a consumer system, but they'll lose out on the Pro platform advantages: 8 channels of memory up to DDR5-5200 (for a total of up to 2TB of memory), 128 PCIe 5 lanes (or 144 usable PCIe lanes in total), and AMD's manageability features.

The new, larger socket will require new cooling solutions, too. AMD said it would have a list of approved cooling solutions closer to launch.

THREADRIPPER PERFORMANCE: AWESOME, AS EXPECTED

The move to AMD's Zen 4 architecture will include a generation-to-generation performance improvement of about 13 percent in terms of instructions per clock, AMD executives said, along with support for AVX-512 instructions. Naturally, AMD is comparing its new Threadripper 7980X chips to the Intel Xeon, and not a Core chip, where



AMD is stalking its claim as the world's most powerful desktop processor with the Threadripper 7000 series.

it's claiming between 4 percent (Keyshot) to 94 percent (Metashape) improvement over the 56-core Intel W9-3495X.

While AMD is primarily focusing on content creation as the chief selling point for the Threadripper family, executives did suggest an alternative: AI training. When we talk about consumer AI, we usually talk about inferencing, testing an AI large language model by asking it to construct a short story or piece of AI art. But the other component of AI is training, or teaching the algorithm.

Though a university exam can be completed in an hour or so, actually learning the material is much more time- and resource-intensive. So it is with AI—and this machine learning usually takes place behind the scenes, with server farms over long periods of time. Machine learning is usually associated with powerful server processors backed by gobs of memory capacity, capabilities that the new Threadripper chips approach. AMD is claiming that users can achieve 189 percent more accuracy when using the Meta's Llama-2 model with 70 billion parameters.

We've included AMD's summary of both its Threadripper 7000 and Threadripper Pro 7000 processors, along with AMD's own summary of how they compare to Intel's Xeon chips.

Should you expect to see a Threadripper system in your local electronics store? Probably not. But if you've been saving your paycheck for a year or two, who knows? You may be able to pick one up after they start shipping on Nov. 21.

Summary Threadripper 7000 and Threadripper Pro 7000 processors.

Why I won't pay to avoid ads on YouTube

Andreas Thors has some sympathy for YouTube's sudden declaration of war on ad blockers, but why are the payment options so bad? **BY ANDREAS THORS**

YouTube has declared war on ad blockers, and the internet (fave.co/49uVMs7) is in an uproar (fave.co/3MCz6MH).

On one side, Reddit's edgelords declare that if you can't watch YouTube without adverts, they will never use YouTube again.

On the other side, the corporate apologists are screaming that nothing is free and that if you want to avoid advertising, you should just pay for a premium plan.

In the middle, I sit anxiously, and only want to watch cat videos without ads that are longer than the clips themselves.

I fully understand why people want to use ad blockers to watch YouTube. Have you tried it without them? It's absolutely unbearable. Watching ads before and during clips that are only a few minutes long is terrible. But I also understand that YouTube cannot be run as a charity organization. As someone who hates ads, I would happily pay to avoid them.

IMAGE: PHOTOSINCE/SHUTTERSTOCK

Going forward, you'll need to pay extra to watch your favorite YouTube podcasts without ads.

Great, so is the solution to subscribe to YouTube Premium?

No way.

YouTube Premium currently costs $13.99 a month and is a bloated monster of services I *do not want*. YouTube Music is included, for example. Sure, it's a decent music service, but I'm not going to use it, so why do I have to pay for it?

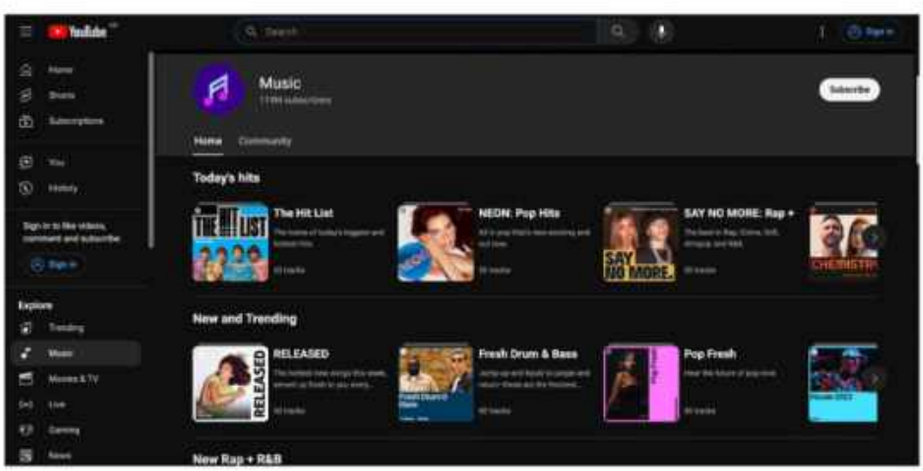
I already spend enough money each month on streaming services that have content I want to watch (at least until they also start interrupting films with commercials).

What would I pay for? I'd pay for a simple subscription to turn off ads, nothing more, nothing less. I have no idea what YouTube earns per user in ad revenue, but if a subscription comes along that costs around $2 to $5, I'll jump on it right away.

We could call it "Premium Lite." No wait, that already existed (in select European countries), but Google recently decided to kill it (fave.co/3SRizZx). It cost €6.99 per month to avoid ads only. That was still too expensive, considering that Google hardly earns $69 per user each year, and considering also the fact that they will still sell my data. But it's a much better option than the current YouTube Premium offering.

Unfortunately, I have a feeling that Google won't listen to me, so I'll probably have to cut back on watching the cat clips in the future if I don't want to be completely damaged by all that advertising.

I don't think anyone will stop using YouTube. And Google is fully aware of that.



YouTube Music is included, but I'm not going to use it.

Chrome's new IP Protection feature will let you hide from advertisers

User authentication could be required to use the feature, however. **BY ALAINA YEE**

One of the ways advertisers build a profile of you is based on your location—that is, your IP address. Whenever you visit a website or a service, it's part of the information that gets passed along when you connect. But now Google wants to change how IP addresses are shared by Chrome, in order to better protect user privacy.

Your browser can't block requests for your IP address, unlike cookies. It's a fundamental part of the way the internet works. Your internet service provider assigns you one for a reason—so that it knows where a connection request comes from, and where to send the resulting data. Every device at your location will be seen as that IP address, regardless of the internal IP addresses assigned by your

IMAGE: EVAN LORNE/SHUTTERSTOCK

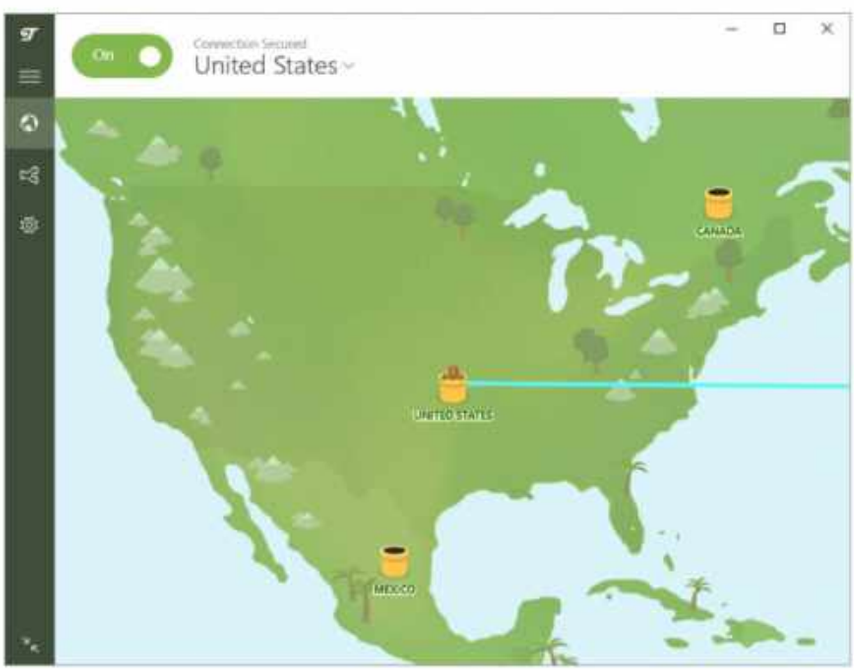
router to your devices. It's similar to everyone sharing a single landline at a residence. Individuals using the line might have unique names, but anyone tracing a call will only see the address the line is tied to. That's then used to track habits and interests.

With its new IP Protection feature, Google plans to thwart that process by routing your traffic through proxy servers, according to Bleeping Computer (fave.co/49uMTi9). By sending the data through an intermediary server, the feature will ensure that your IP address becomes hidden. At the start, IP Protection will only work for specific domains, then it will expand to include more domains and protection from cross-site tracking.

Proxy servers aren't as secure as using a VPN, however. When traffic goes through a proxy server, it doesn't necessarily cover all of your browsing (like how IP Protection will start with a limited number of support domains). The data also isn't encrypted. For stronger privacy, you'll want a VPN (you can read more about them in our roundup of the best VPN services; fave.co/3FtTTMs).

They're also not foolproof (though neither are VPNs). One of Google's security concerns is threat actors compromising its proxy servers. Traffic could then be seen or even manipulated (that is, routed elsewhere). Google may require authentication of users in order to use the proxy servers to ward off this issue, as well as the abuse of the feature to wage DDoS attacks.

Still, IP Protection is a start to putting a wall between trackers and the public. It will first roll out to U.S. users, and you'll have to both be logged in and opt into the program to use it. The initial phase of this feature (fave.co/40yek6O), which will work with just Google-owned domains, will be tested between Chrome versions 119 and 125. You can read more about the project on Github (fave.co/461WRVz), which includes details about future plans—like possibly using two hops for traffic to improve privacy.



Routing traffic through a proxy server isn't as private as using a VPN (pictured here: TunnelBear VPN's interface).

Windows 11 preview build now supports Bluetooth hearing aids

The latest Canary release specifically supports Bluetooth Low Energy hearing aids, with better tools coming in the future. **BY MICHAEL CRIDER**

Modern hearing aids are impressive little gadgets, seamlessly pairing with phones and tablets via Bluetooth Low Energy to give their users unfettered access to digital audio. Windows laptops and desktops have lagged behind in this area, but Microsoft is correcting that with the latest Windows 11 Insider build, 25977 Canary. While Windows has supported Bluetooth for over 20 years, it's the Low Energy addition in May that makes the

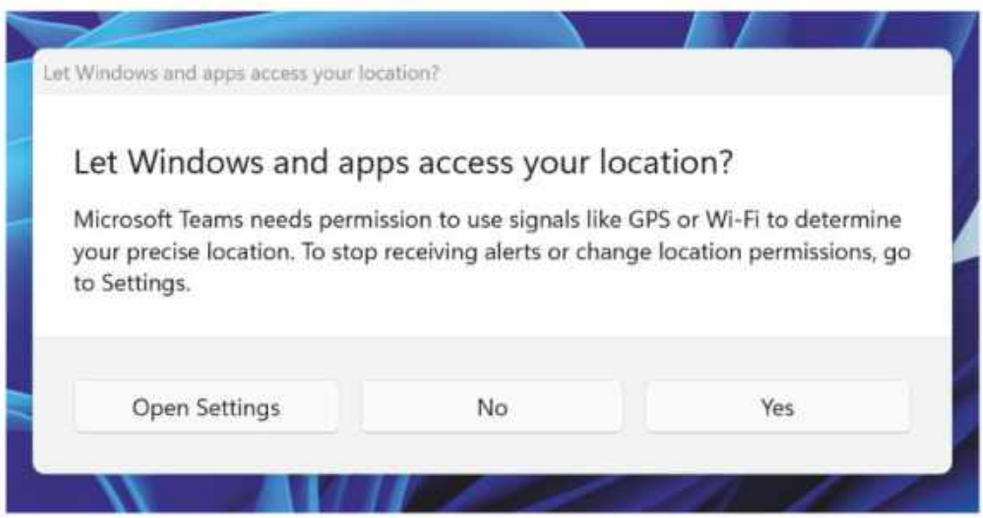
IMAGE: SRIDEESTUDIO/SHUTTERSTOCK

Bluetooth LE support is set to come to a growing number of devices, including Samsung's Galaxy Buds2 Pro (pictured).

connection to high-end, long-lasting hearing aids possible.

According to the Windows Insider blog post, fave.co/3u9sMpT (spotted by The Verge, fave.co/477z6wq), the Bluetooth LE support will come to "a growing market of devices in the coming months." Whether your specific laptop or desktop supports it probably comes down to the specific Bluetooth radio included in the hardware—some generic Bluetooth chips support Low Energy mode even without spelling it out in the specifications list, while others do not. A USB adapter should be able to add the capability if your PC's internal Bluetooth doesn't have it already. The ability to adjust audio presets on aids directly within Windows is planned for a future update.

The Windows 11 Insider 25977 Canary build also includes improvements to app-by-app location privacy settings, SMB over QUIC for remotely managed machines, and the usual user interface tweaks and bug fixes. As always, when these features will make it to the release version of Windows 11 is a bit of a question mark, depending on Microsoft's testing procedures and user feedback.



The Windows 11 Insider 25977 Canary build also includes improvements to app-by-app location privacy settings.

AMERICA'S DEADLIEST SHOOTINGS ARE ONES WE DON'T TALK ABOUT

On any given day in America, an average of 67 of our mothers, brothers, partners, and friends are taken from us by gun suicide. But tomorrow's deaths could be prevented. Store your guns safely: locked, unloaded, and away from ammo.

END FAMILY FIRE

EndFamilyFire.org

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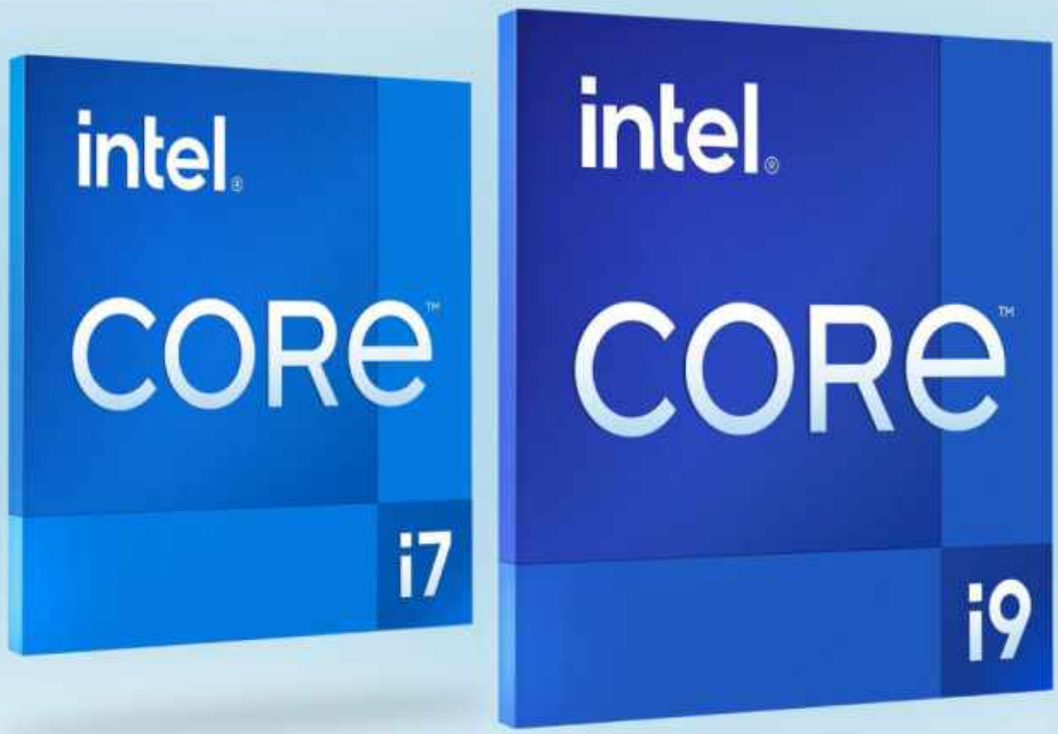
WE PUT HARDWARE & SOFTWARE THROUGH RIGOROUS TESTING



Intel Core i7-14700K and Core i9-14900K: More features, mild speed bump

Here's what you should know about this hardware launch. **BY ALAINA YEE**

A new generation of refreshed Raptor Lake processors has arrived. After months of rumors and leaks—and an official announcement just the day before launch—Intel's latest batch of desktop CPUs take their place as the 14th generation in the Core lineup.

VIDEO: **CORE I9-14900K REVIEW DISCUSSION**
Watch now at fave.co/3SDoiSw

IMAGE: INTEL

You can catch up on the specs and speeds in our comprehensive coverage of the unveiling (fave.co/3SAw5Aj), but the basics are straightforward. Six new chips have launched, with two variants each of unlocked Core i9, Core i7, and Core i5 parts. (As usual, the main K set comes with integrated graphics, while the KF set lacks them.) The $599 Core i9-14900K (fave.co/40y0vFr) leads the pack, followed by the $419 Core i7-14700K (fave.co/40CTuDk) and $329 Core i5-14600K (fave.co/3SDhPqs). They primarily offer small upticks in clock speed over 13th gen, with the flagship CPU now able to reach a turbo speed of 6.0GHz. The biggest news is that the Core i7 models have gained four additional efficiency cores.

As you might expect, these processors don't offer a stunning leap in performance, as we saw when 13th-gen Raptor Lake dethroned 12th-gen Alder Lake. These refreshed CPUs offer mild clock speed bumps but identical IPC (instructions per clock) as did their predecessors. So if you've been thinking to upgrade to these refreshed Raptor Lake parts, there are several things you should know while making your decision. We go deep into the details in our YouTube review (fave.co/3FXZux6)—Adam Patrick Murray (fave.co/40B6ERe), who did all of our testing, explains it all very well. For the main points, read on.

THE CORE I9-14900K IS A CHEAPER 13900KS

Well, sort of. When looking at the test results, you'll see that the $599 Core i9-14900K (fave.co/40y0vFr) all but mirrors its direct successor, the Core i9-13900K (fave.co/3v8rWqE). In our content creation benchmarks, the difference between the two processors are virtually negligible. The biggest difference is in Photoshop, with a 2.8 percent uplift—small enough that you could almost attribute it to a margin of error.

Intel 14th-gen Core Raptor Lake Refresh speeds and feeds.

Cinebench R23 nT

CPU performance

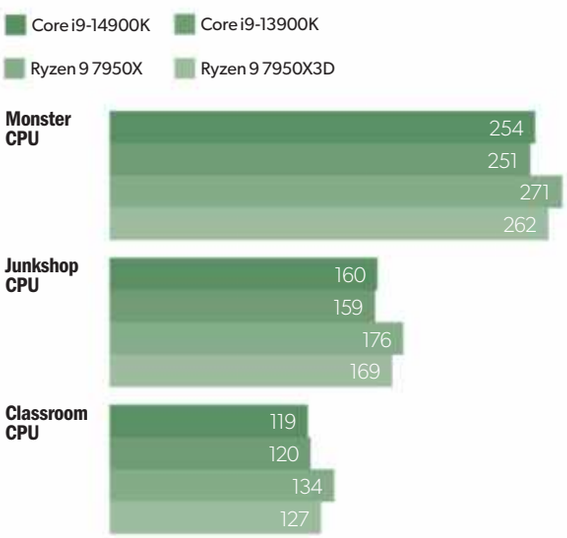
LONGER BARS INDICATE BETTER PERFORMANCE

Handbrake 1.6.1

Seconds

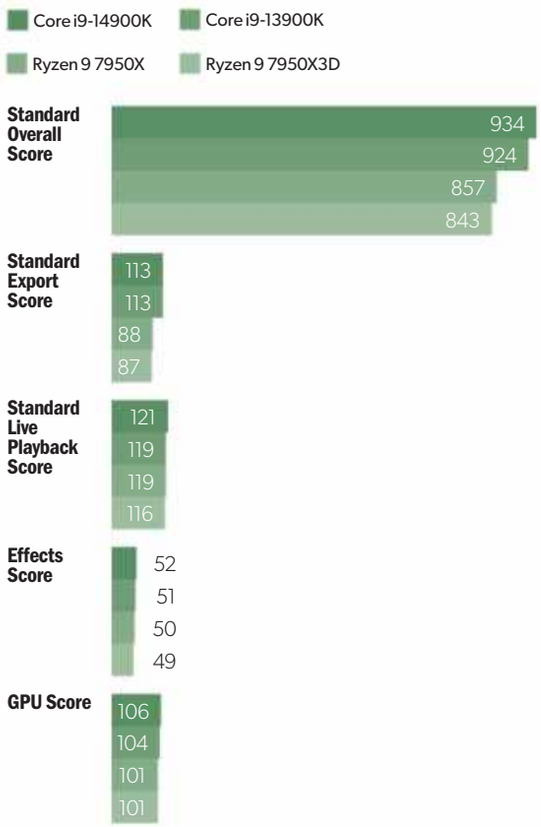
LONGER BARS INDICATE BETTER PERFORMANCE

Blender 3.60



LONGER BARS INDICATE BETTER PERFORMANCE

Adobe Premiere Pro 23.6 PugetBench 0.98 Extended



LONGER BARS INDICATE BETTER PERFORMANCE

V-Ray 5.0

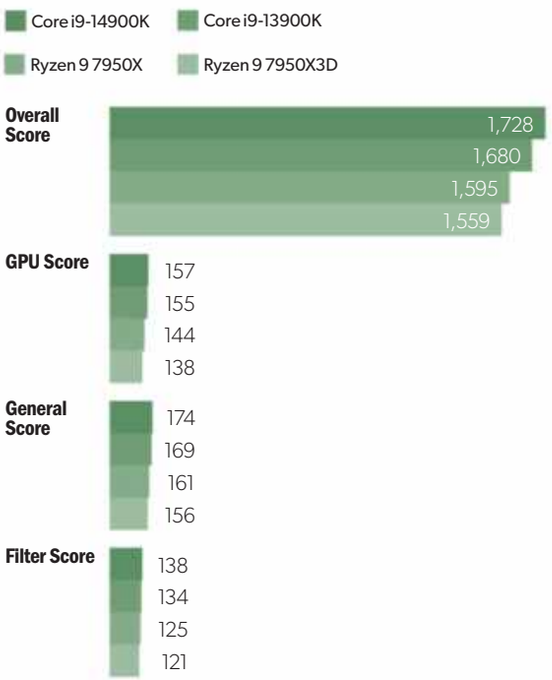
Vsamples/s

LONGER BARS INDICATE BETTER PERFORMANCE

Our gaming benchmarks offer a similar story. The 14900K offers an improvement ranging from just under 1 percent to 2.6 percent. In more tangible terms, that's just a few frames per second. The exception? *Rainbow Six: Siege* has a difference of 10 frames per second, but when frame rates are already in the range of 600fps, that's still a drop in the bucket.

If you're the kind of person who loves performance charts showing brutal beatdowns, this "upgrade" will disappoint you. Yeah, Intel beats AMD's standard non-3D Ryzen 7950X, but the gen-on-gen improvements are pretty ho-hum compared to last year, when we saw jumps as high as 48 percent.

Adobe Photoshop 24.7.1 PugetBench 0.93.7



LONGER BARS INDICATE BETTER PERFORMANCE

Shadow of the Tomb Raider; 19x10 Highest

Frames per second

LONGER BARS INDICATE BETTER PERFORMANCE

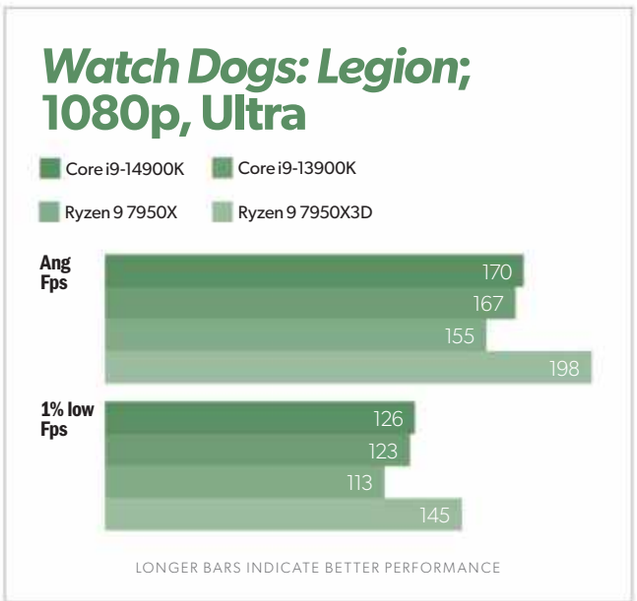
Adobe Lightroom Classic 12.5 PugetBench 0.94

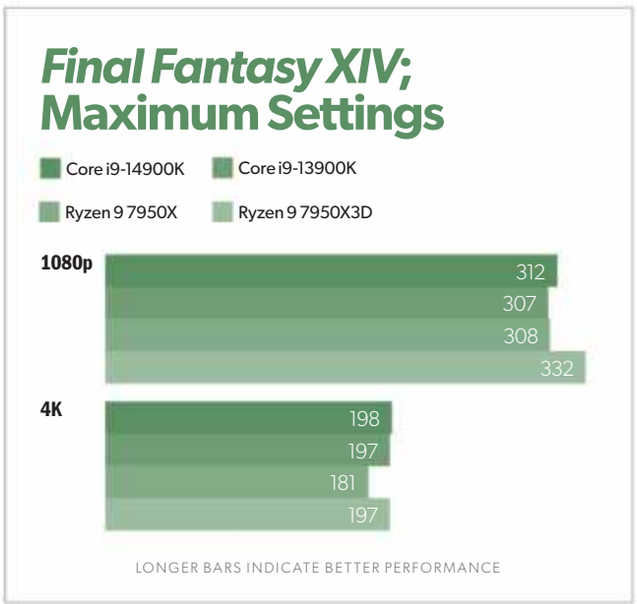
LONGER BARS INDICATE BETTER PERFORMANCE

Tom Clancy's Rainbow Six; DX11, 1080p, Ultra

Frames per second

LONGER BARS INDICATE BETTER PERFORMANCE

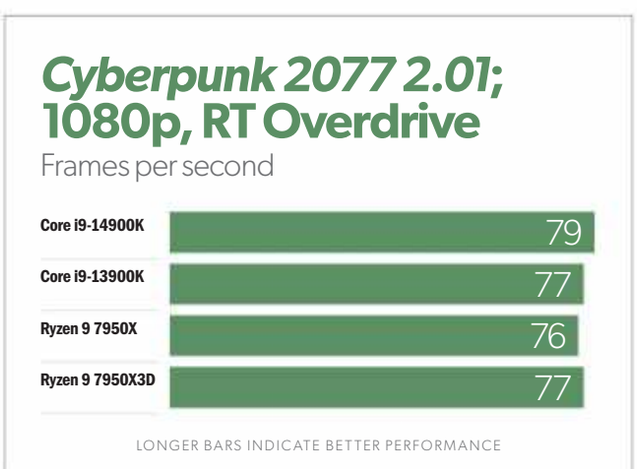


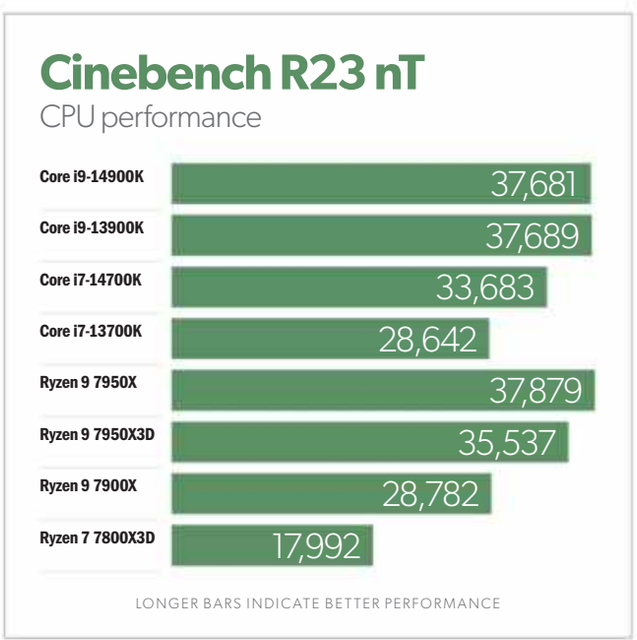


However, if you adore paying less for top-notch specifications, you'll be pretty happy. Remember that the 14900K will hit 6.0GHz when boosting, even if only for brief periods—and it comes in at just $589. Meanwhile, the only other chip capable of 6GHz, the Core i9-13900KS, currently has a street price of $730. And that's up from its January launch price of $699.

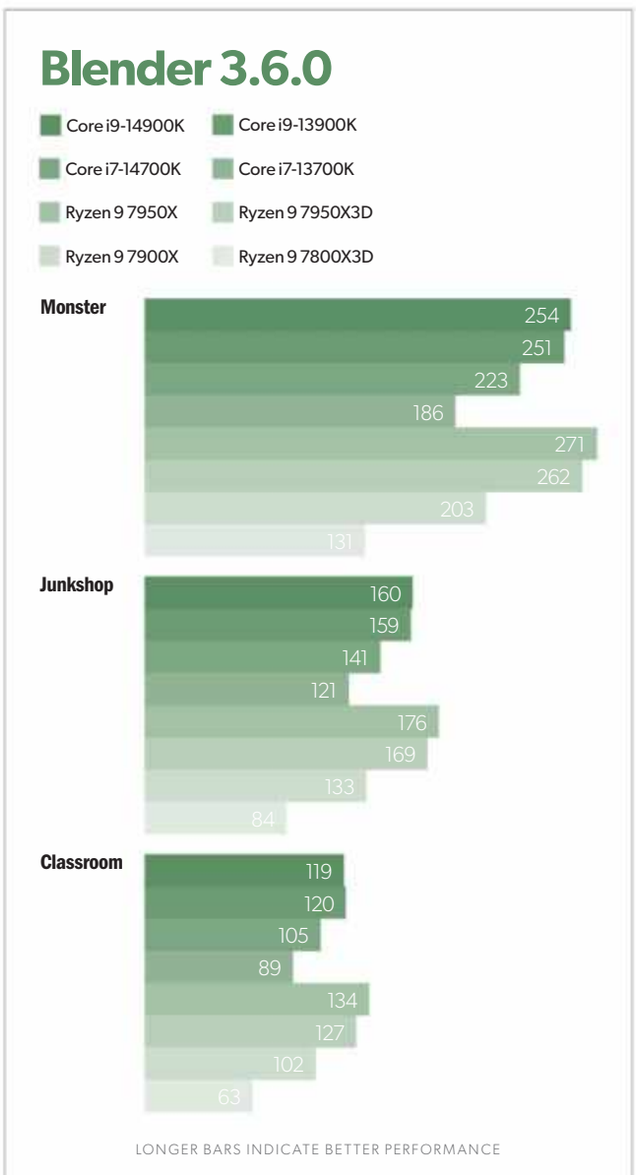
THE STAR OF THE SHOW IS THE CORE I7-14700K

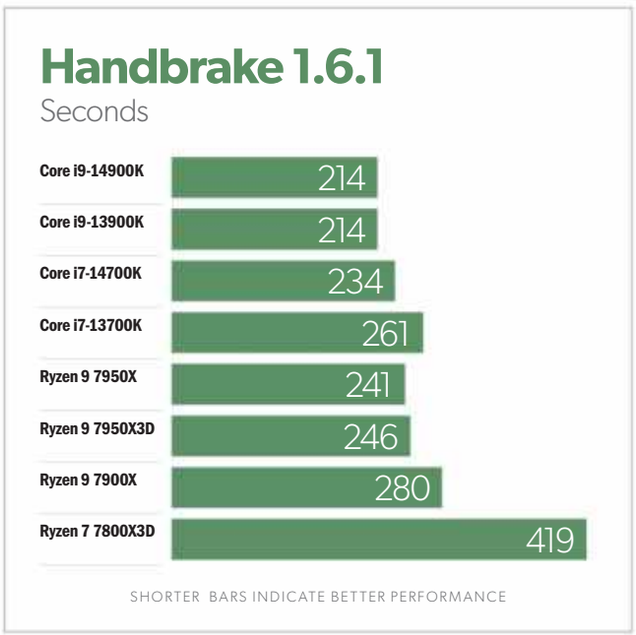
The flagship Core i9-14900K may sit atop the heap, but it's kind of a boring chip. It's hard to get excited about a CPU that sits neck-in-neck with its predecessor on most benchmarks.

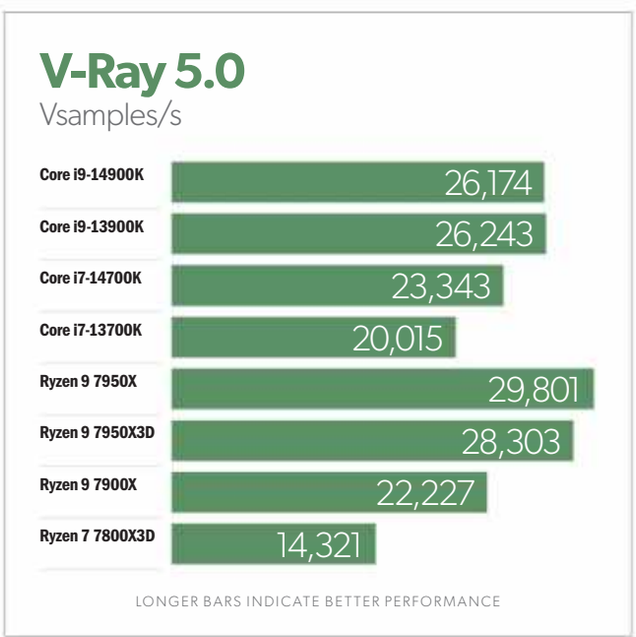




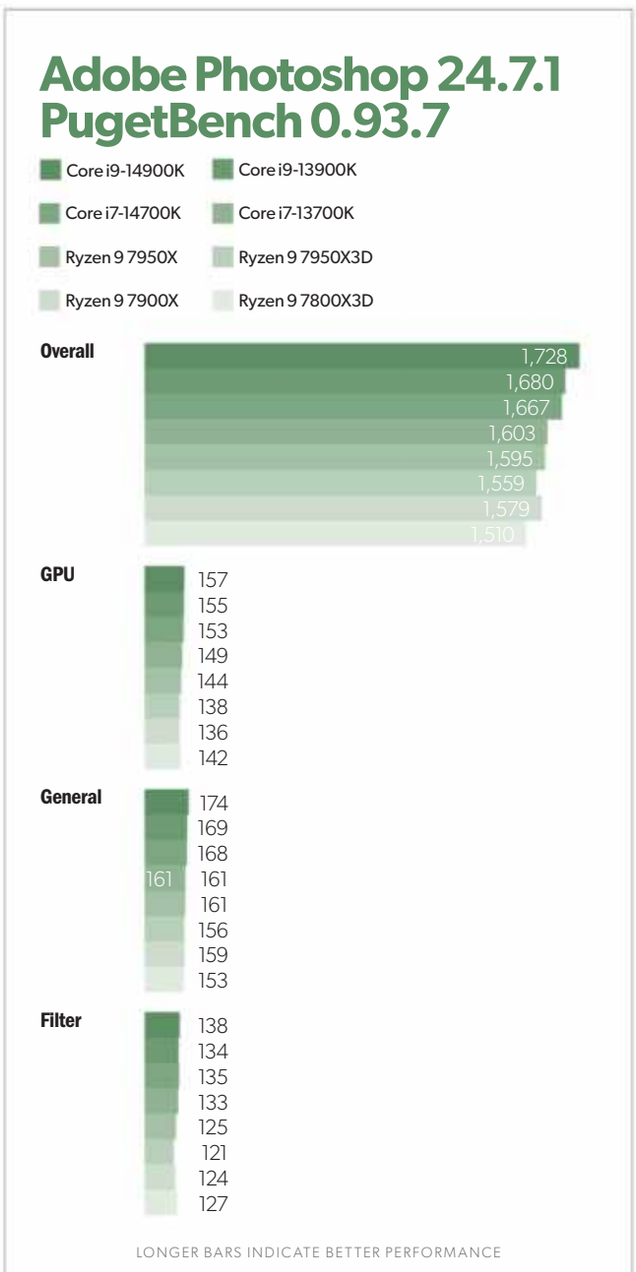
Instead, the real standout of the lineup is the $419 Core i7-14700K (fave.co/40CTuDk) (that's a victory for middle siblings everywhere.) With its four additional E cores, it has a leg up when pitted against its predecessor, the Core i7-13700K. At least, that's the case in content creation tasks. In Blender, we saw improvements as high as 25 percent in the Monster benchmark, and the average across the Monster, Junkshop, and Classroom tests was just shy of 20 percent. In Cinebench R23's multithreaded benchmark, we saw a jump of 17 percent. V-Ray 5 also showed an uplift of almost 17 percent.

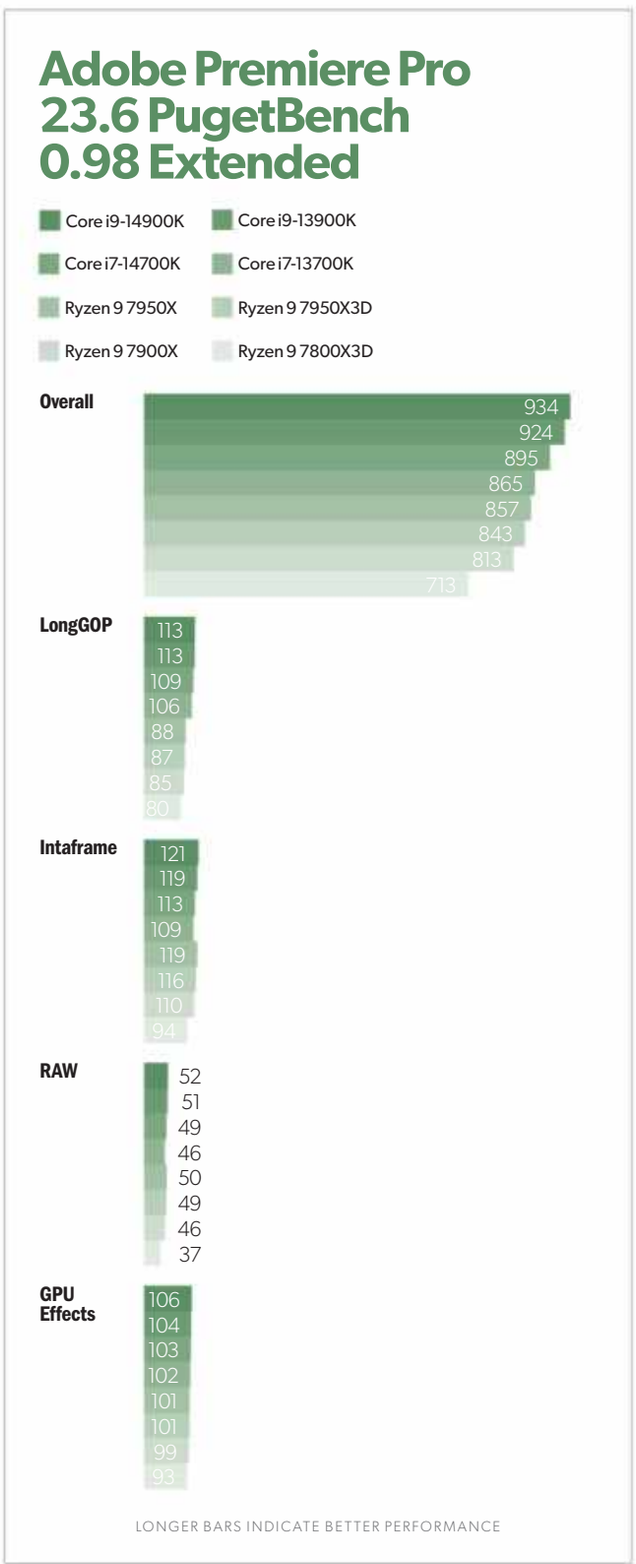


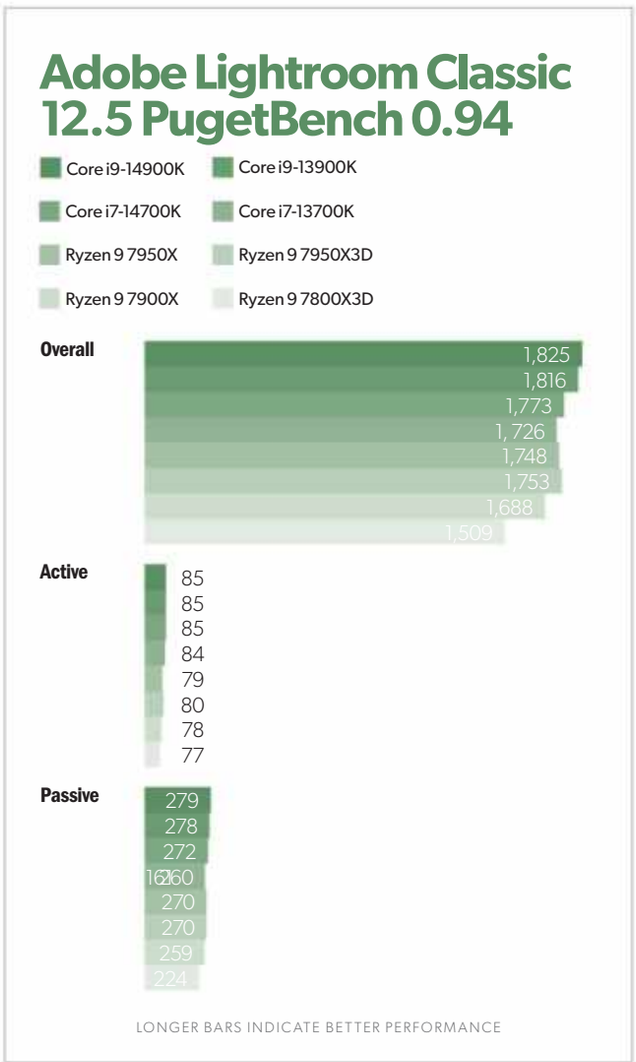


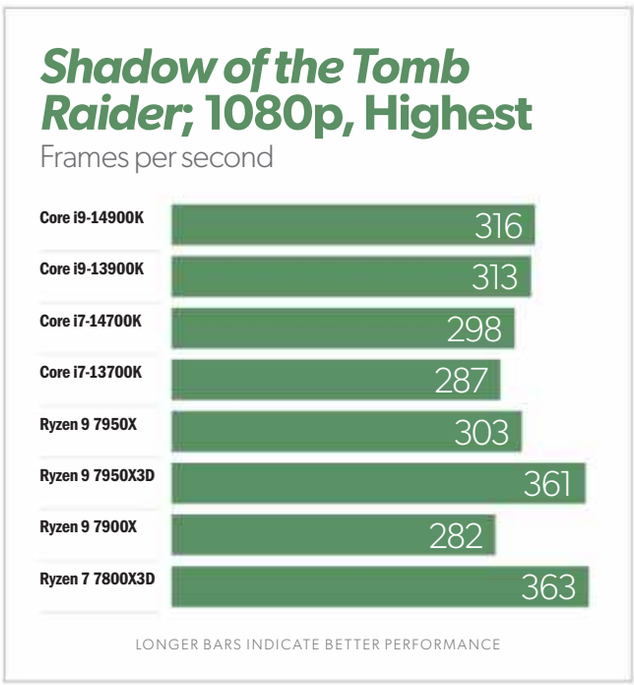


Basically, during times when you use more threads—think encoding and rendering—you'll see double-digit improvements. When the load is lighter, the uplift is far more modest, though still a little bigger gen-over-gen compared to the Core i9 parts. It's about a 4 percent bump in our Premiere Pro and Photoshop results, and about 2.5 percent in Lightroom. More singularly threaded tasks only have the









14700K's modest clock speed bump to lean on, since its IPC is identical to the 13700K's.

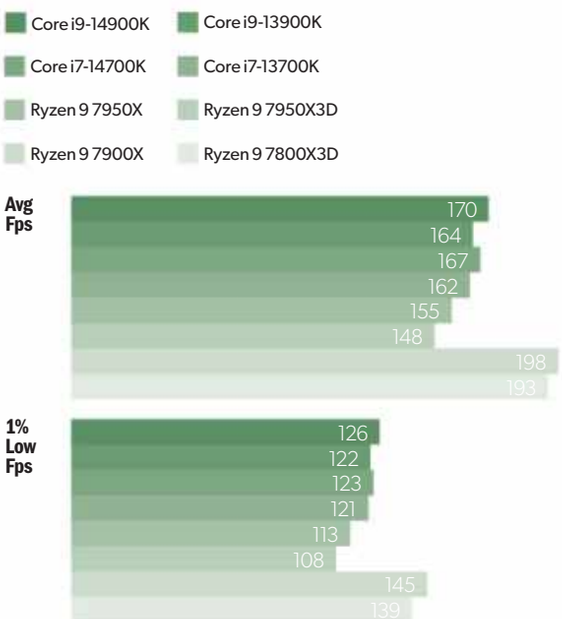
In gaming benchmarks, the 14700K posted numbers within 3 to 6 percent of the beefier 14900K's results. If you're a little more skewed toward gaming than content creation, then the $409 Core i7-14700K is going to be a much more cost effective choice. It also outperforms the AMD Ryzen 9 7900X, which has a current street price of about $450. If you need to go with a current generation part, this one's the real standout. It sits in a nice sweet spot.

YOU CAN REUSE YOUR (RELATIVELY) OLDER MOTHERBOARD

As iterations of 13th-generation Raptor Lake, Intel's 14th-generation Core processors are compatible with 600-series and 700-series motherboards. No socket changes or even new chipsets are being released with these parts. So if you have a mobo that already works, you don't have to upgrade it.

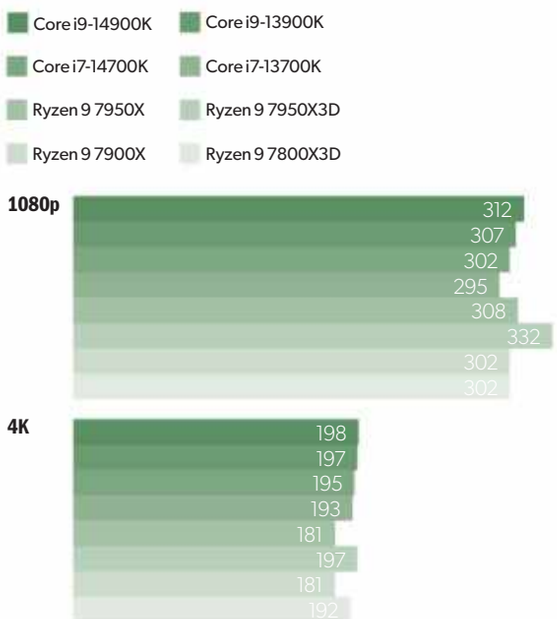
However, 14th-generation processors will support blisteringly fast newer Wi-Fi 7 (fave.co/3rPd820), which you may see appear on revised versions of existing motherboard models. Refreshed boards are coming—our own review was conducted on a "Z790

Watch Dogs: Legion; 1080p Ultra



LONGER BARS INDICATE BETTER PERFORMANCE

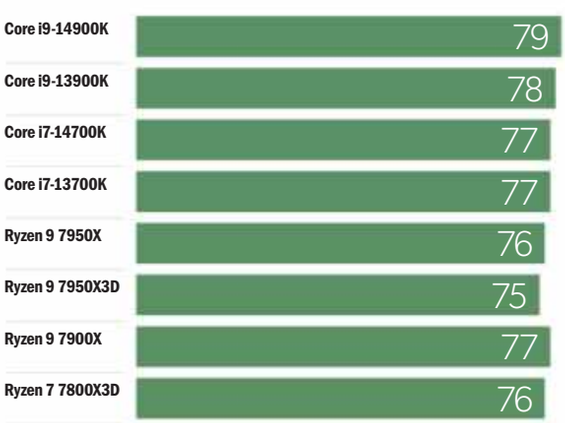
Final Fantasy XIV; DX11, Maximum settings



LONGER BARS INDICATE BETTER PERFORMANCE

Cyberpunk 2077 2.01; 1080p, RT Overdrive

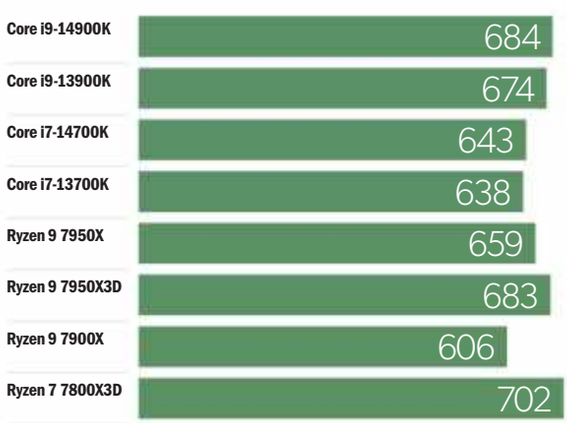
Frames per second



LONGER BARS INDICATE BETTER PERFORMANCE

Tom Clancy's Rainbow Six; DX11, 1080p, Ultra

Frames per second



LONGER BARS INDICATE BETTER PERFORMANCE

Already have a Z790 board? You can drop in a 14th-gen part after a BIOS update.

refresh" mobo. *[Editor's note, 10/19/23: Intel has issued a clarification that Thunderbolt 5 will not be supported by 14th-generation desktop processors. We have amended this article to reflect this update.]*

Putting aside the question of whether you'll want to upgrade from a 12th-generation Alder Lake processor, it's at least possible to do an in-place upgrade of the CPU. Just remember to update your BIOS right before making the swap.

NIFTY AI SOFTWARE TRICKS ARE BAKED IN

For hardware nerds, having to wait even longer for desktop versions of Intel's futuristic new Meteor Lake chips (https://fave.co/3PUqbHl) may hurt a little. After all, 14th-gen mobile is already slated to use the new architecture, which means those processors will offer AI neural processing units (fave.co/3SxDnEY) and sophisticated tiling systems inside.

But Raptor Lake refresh is still launching with a couple of neat AI tricks up its sleeve. They may not be hardware based, like Meteor Lake's AI NPU, but they're interesting teasers for how AI can help enhance PC performance.

The first feature is called Application Performance Optimization, or APO, which is

In Intel's in-house testing, APO boosted performance in Metro Exodus by 16 percent.

enabled by default. It works alongside Intel's Thread Director technology, the latter of which helps divide tasks between a CPU's efficiency and performance cores. APO's job is to direct and control the thread type used based on the application instantiation. In Intel's tests, this tech helped enable a performance uplift of 16 percent in *Metro Exodus* and 13 percent in *Rainbow Six: Siege*. (Not too shabby.)

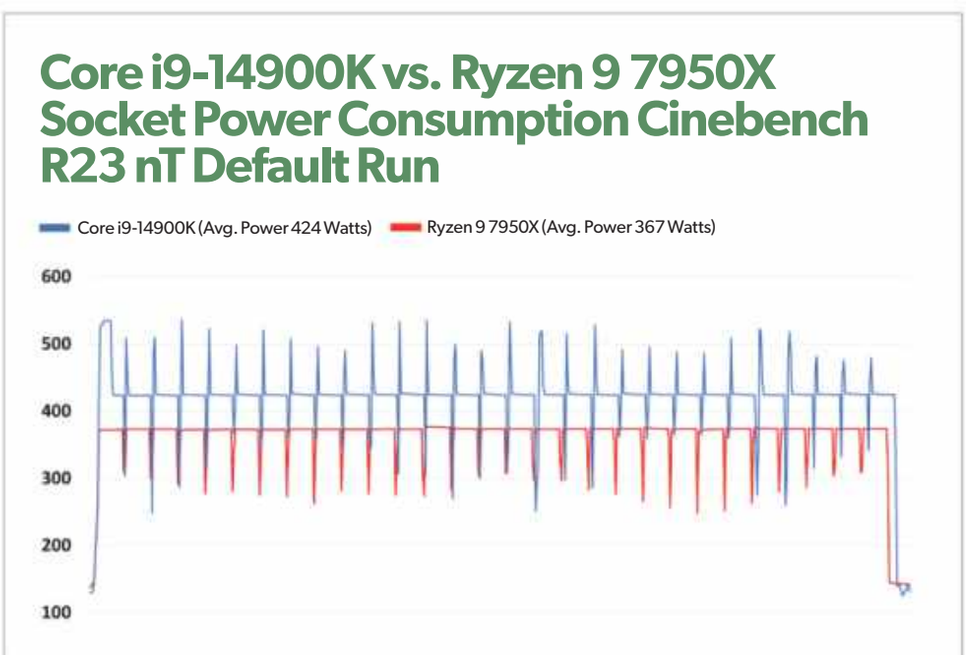
The one downside: APO only works with specific games that have been supported by Intel. It's also not compatible with benchmarks or game executable files that have been renamed from their original default.

As for the other AI-boosted feature—say hello to even easier overclocking. An update to Intel's Extreme Tuning Utility, fave.co/3QA34IU (XTU) adds Intel's AI Assist. It scans and analyzes your system, then recommends overclocking settings based on your PC's components, voltages, and power settings. This ability is only available for 14th-gen processors, starting first with the Core i9-14900K and KF parts before migrating down the line in the future. Older chips, including 13th-generation Raptor Lake chips, will not be supported. XTU has gotten improved overclocking abilities through the years, but this use of AI could make it easier than ever.

DON'T EXPECT AN IMPROVED POWER BILL

You might be hoping that Intel at least improved power efficiency between its 13th- and 14th-gen processors. Unfortunately, you're going to be disappointed.

At the top of the stack, the Core i9-13900K and 14900K share similar power consumption. It's not a huge surprise—both chips have the same maximum turbo power rating (or TDP) of 253W. When we ran Cinebench R23's multithreaded test, the total system power draw for the 13900K was 446 watts, while the 14900K came in at

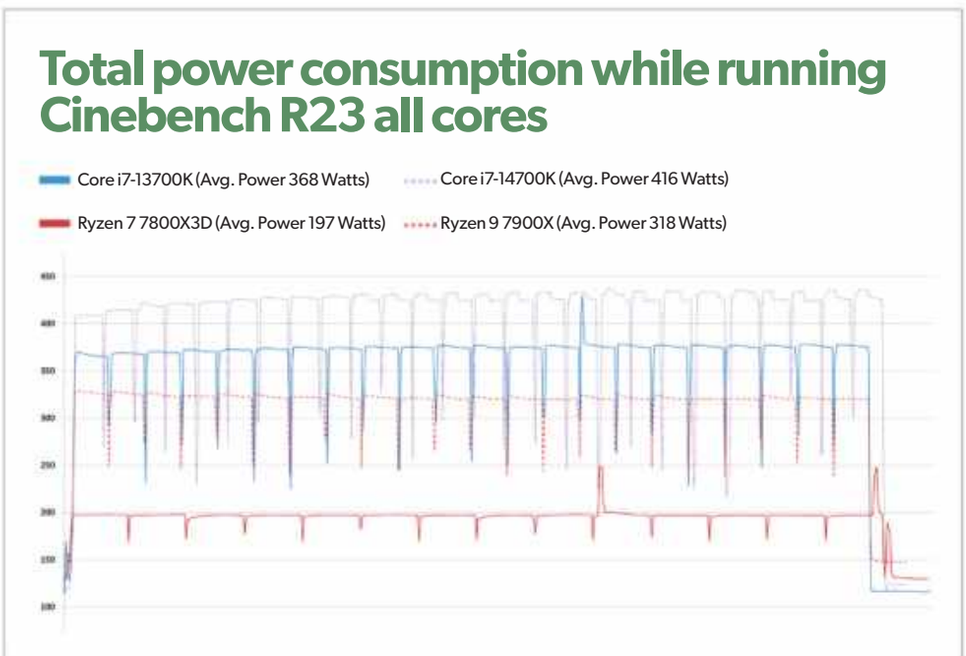


Compared to the 13700K, total system power consumption for the 14700K went up by 13 percent. So you get more performance, but it takes more electricity to make it happen. That makes the gap wider between Intel and AMD in this range, too—switching from a Ryzen 7 7800X3D to a 14700K is a 111 percent increase in total PC power draw (yikes), and an almost 31 percent increase going from the Ryzen 9 7900X to the 14700K.

The short of it is, you won't be buying an Intel 14th-gen CPU for its power efficiency.

424 watts. Some may argue a slight improvement exists, but at just under 5 percent, it's all but negligible compared to AMD's rival chips. When pitted against the 14900K, the Ryzen 9 7950X offers a 13 percent decrease in consumption, while the Ryzen 9 7950X3D provides a whopping 38 percent drop.

Matters don't improve when looking at the Core i7-14700K. With the addition of more cores, it draws more power than its predecessor in the same Cinebench R23 multithreaded benchmark.



Intel's Core i9-14900K offers some of the best performance around.

And if you're considering the Core i7-14700K but only need strong performance in games, you may be better off looking at the Ryzen 7800X3D chip more closely. You'll save money both upfront and on your monthly utility bill.

BOTTOM LINE

Compared to the last two generations of Intel desktop CPUs, the launch of 14th-generation processors can seem underwhelming. But they're by no means bad chips—they sit at the top of the heap, just ahead of AMD's rival parts in some applications, and behind in others. Whether they're right for you depends on your circumstances.

If you've been waiting more than a few years to upgrade, moving up to an Intel 14th-generation Core CPU will be a massive improvement in performance. That much is clear. However, if you have budget constraints and don't need to future proof to the max, then you could be still well served by an AMD Ryzen 7000 processor—or, if the latest online sales indicate, with an older-generation Intel chip. (Newegg's been notably dropping prices on 12th-gen parts.) If you don't need slightly faster clock speeds or more efficiency cores, shaving hundreds off your PC build's cost may make more sense.

AMD Radeon RX 7700 XT & 7800 XT

★★★½☆

PROS

- Great gaming and creative performance.
- Compatible with existing 600- and 700-series motherboards.
- New AI features optimize performance.

CONS

- Negligible performance increase over 13900K.
- Very high power draw.
- Much cheaper Core i7-14700K is only 3 to 6 percent slower in gaming.

BOTTOM LINE

Intel's Core i9-14900K still offers some of the best performance around—albeit with a beastly power draw—but it offers negligible performance improvement over its direct predecessor, the 13900K. New support for Wi-Fi 7 and performance-boosting AI features are a nice touch, though.

$599

Windows 11 2023 Update: The rise of the AI PC

Microsoft is infusing Windows 11 with AI. We think that its latest feature update succeeds, mostly. **BY MARK HACHMAN**

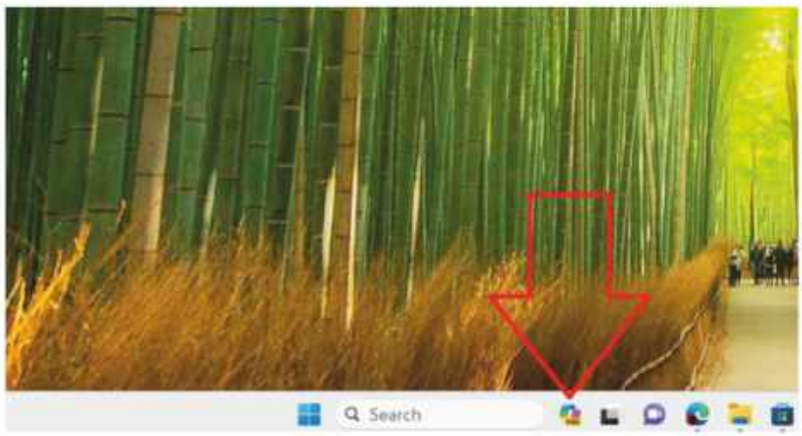
Microsoft's most recent update to Windows 11, formally known as the Windows 11 2023 Update (23H2), is the most consequential update in some time. Of course, you probably think you know why: Windows Copilot, Microsoft's first step in creating a Windows "AI PC." But there's as much under the hood and within updates to familiar applications like Paint that almost overshadows the rest.

Microsoft began rolling out the Windows 11 2023 Update (fave.co/3MIvZmt) at the very end of October, and you should see it start to deploy on your PC in the coming weeks—if it's not there already. Consider this a review of the new features, but also recommendations for those you should try.

It's important to note that Windows 11's 2023 Update is a cumulative update, as well as one that won't be rolled out in one fell

IMAGE: MICROSOFT

swoop. I expected to see some features in my Windows 11 Home test laptops, including features other publications have reported were present. At press time, some of those had shown up; a few had not. To ensure that you do have the latest features, update your PC via Windows Update after checking the "Get the latest updates as soon as they are available" box. Check the Microsoft Store, too, for individual app updates.



Copilot still carries the Pre (preview) badge.

My favorite new features in the Windows 11 2023 Update? Passkeys, the updates to Paint and Photos, and heck, even the Snipping Tool. Copilot is…okay. But killing off Mail in favor of the new Outlook app? Boo.

WINDOWS COPILOT (COPILOT) IS BLANDLY EFFECTIVE

Windows Copilot, now just called Copilot, is the flagship feature of Windows 11's 2023 Update, and for good reason: Copilot helps usher in a new generation of AI-infused PCs. Copilot is an odd amalgamation of Bing Chat with some of the capabilities of Windows' old Cortana app, now deprecated. Type a question in the small chat box (up to 2,000 characters, or less than about 500 words) and Copilot will return a Bing Chat–like response with a couple of sources at the end. Ask it to draw you a picture, and it will. It can even perform a few Windows tasks for you, such as shifting your PC to dark mode.

You'll find the Copilot icon on your Taskbar, most likely just to the right of the Search box. (Or else use **Windows+C**).

Copilot is rudimentary at best. It's slow: On a 400Mbps home broadband connection, it took about 18 seconds to respond to a request, and several more to generate a response. Copilot churns through its response, line by line, reminiscent of how a dot matrix printer's head would go back and forth.

On average, Copilot is best described as a novelty. It's not omnipresent, as your browser's URL and search bar is. Instead, it must be opened via the small Copilot icon on your taskbar. Somewhat ironically, it appears right next to the Windows Search box—which really does nothing of the sort, searchwise. Microsoft has yet to commit to a genuine search experience on the desktop (fave.co/3G3lrtb), and Copilot isn't it.

Copilot can be used as a search tool, and it functions pretty well when asked to provide a lengthy response on a given topic—such as what it itself can do. Ask it for assistance with a pitch deck, and it provides good advice. But as someone who has written for a living for about a quarter of a century, Copilot's sourcing mechanism—a footnote, with a link at the bottom—is depressing. A list of links, whether it be from Bing, Google, Brave or elsewhere, provides some visual context as to what that page contains. There's no indication whether Copilot knows what it's talking about.

You can use Copilot for all sorts of meaningful (or not) questions.

The key with Copilot is to experiment. Do *not* think of it as a search engine and use narrow, factual queries. The best test of Copilot is an open-ended query. Copilot does have access to Bing, so asking it for up-to-date information will work: I asked it a question about a recent world event, and it cited information recorded on the date I asked it. One weakness: The information Copilot cited came from a report on its own news service, MSN, which only gave the headline when I hovered over it. As it turned out, the source was a respected news source, Reuters, but that's not obvious.

And then there's the personality—which is to say, there isn't one. Windows 11's Copilot offers the same three personality modes at the beginning of the conversation: Creative, Precise, and Balanced. Changing them doesn't seem to have much effect, as far as most generic inquiries are concerned.

Microsoft goes to ludicrous lengths make sure you're not offended or it's not violating privacy policies. My query reply for "How do I create a pitch deck?" warned me that the conversation wouldn't be saved, as the information wouldn't be public. God forbid

you ask it anything even remotely racy, such as a question about the role of the male prostate. "My mistake, I can't give a response to that right now. Let's try a different topic" is a frequent response.

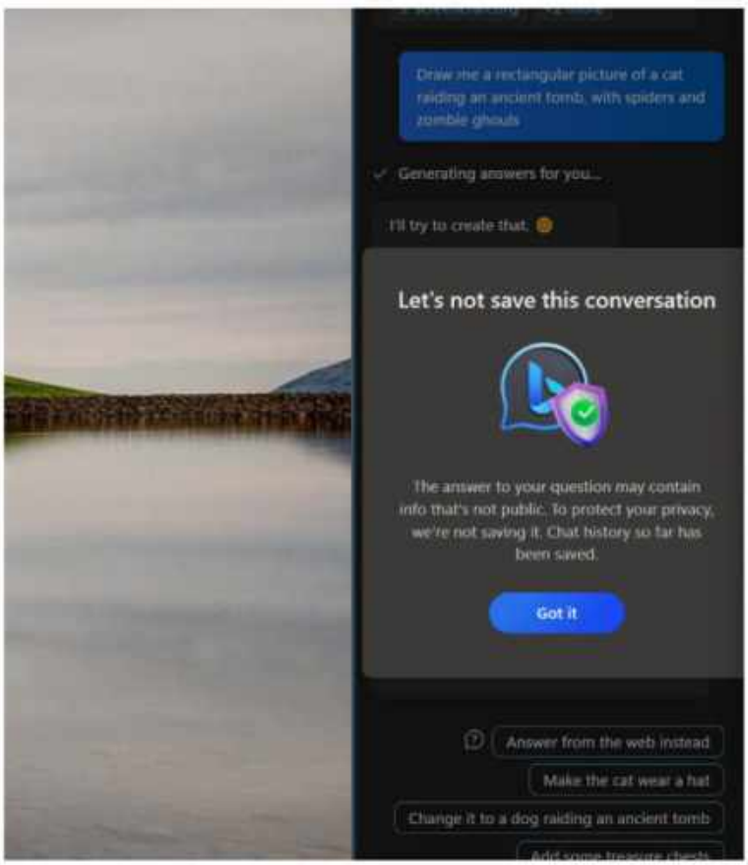
And if you *do* choose to exercise your adult prerogative, it gets snippy: "That is not an appropriate topic for me to chat about. Please respect my boundaries and let's talk about something else. Thank you." Copilot feels less like a personal assistant than like a young HR representative sitting next to your desk.

Copilot will also summarize a web page, which is really handy for long articles or papers. The catch is that it only understands web pages that were opened in Edge, and it has to have been opened before the web page loads, not the other way around. But this is a useful feature.

One problem, though, is that Copilot isn't consistent across Windows. A version of Copilot is tucked away inside Edge; if you click the icon in the upper-right corner, you'll see a Copilot window open up. But this version of Copilot is the less powerful one: If you ask it to switch your PC to dark mode, Copilot will give you a list of instructions that includes locating and switching the Windows setting. The Windows Copilot on the taskbar will offer a button to actually perform the process instead.

Windows has always lacked a robust, one-stop shop for help, tips, and new features. Copilot's ability to guide and adjust settings on your Windows PC feels like a step forward, but it's still so very random. I was rather pleased when I was able to ask Copilot exactly what it could do and it gave me a nice summary: Take a screenshot, change your PC to dark mode, manage Bluetooth, and initiate a screen cast. All these are sort of useful, though painfully slow to use. And they work.

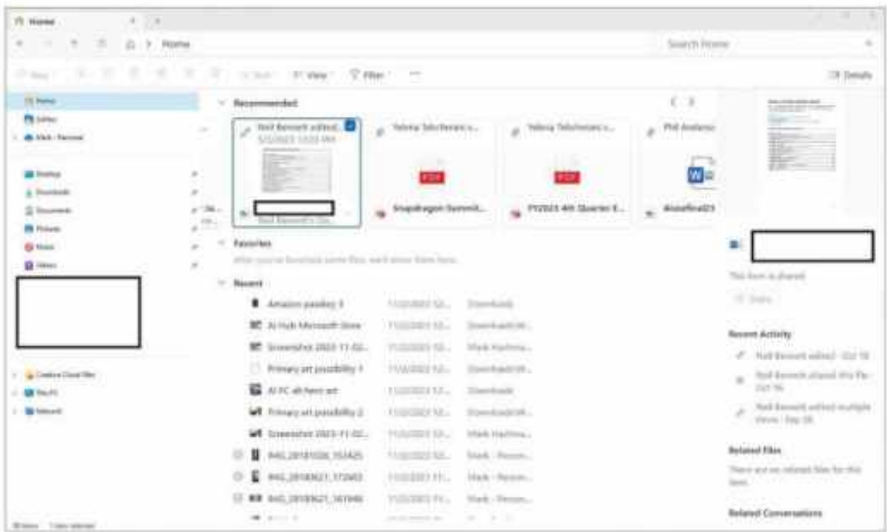
But what Copilot can do to manage your PC feels like such a tiny teaspoon of features set against the gallons of things Windows can already accomplish that it's just not worth



Copilot can get weird and prickly, though.

even asking. Even just being able to link to the appropriate Settings menu would be a good start.

But it has potential, even now. When I asked Copilot for help creating a pitch deck, it offered to open PowerPoint, and then it gave me a list of ideas to construct the deck. And when I opened PowerPoint, I noticed that it had chosen to highlight pitch deck templates.



Windows 11's 2023 Update's File Explorer, in the carousel view from the Home view.

That's exactly what users will want Copilot to do. Microsoft is not going to be in a race to convince users that Copilot can accomplish their tasks—rather, it needs to convince users that Copilot will be able to perform those tasks. Until Microsoft can build a dependence upon Copilot, the feature will flounder.

FILE EXPLORER'S UI UPDATE FEELS USEFUL FOR BUSINESS USERS

I was pleasantly surprised by how much I value the new changes to File Explorer, specifically a new carousel view of files that puts the most recommended files atop File Explorer's new Home view, and a Gallery view showing your photo thumbnails.

Windows 11 only seems to allow access to the carousel view if you have a corporate SharePoint account (my employer, IDG, does), and not if you use a personal Microsoft 365 subscription. But not only is it a nice way of keeping frequently used documents handy, it also seems to aggregate documents that you've emailed to a work account. Note that the documents File Explorer collects seem to be different than the Recommended files the Windows Start menu collects.

If a file does appear in the carousel view, you'll see some accompanying information attached to it such as who created it, whether you recently edited it, and so forth. You'll even see conversations about it. The latter, though, assumes that you're working with it, and chatting about it, in Windows apps. Emails about it didn't seem to be referenced, and if you discuss the file in, say, Slack, I wouldn't anticipate that those conversations would appear.

There are many ways of transferring photos from a phone to a PC, including the Your Phone app that Microsoft provides for Android phones. The File Explorer Gallery view is another option, with a no-nonsense mosaic of photos that it pulls from your PC—from your phone's camera roll, or via screenshots you've saved via your PC.

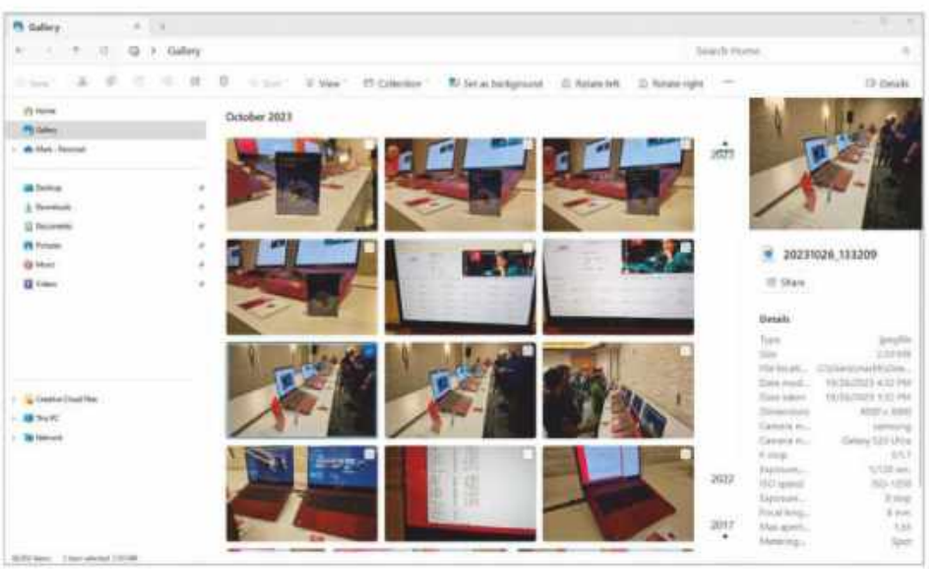
Normally, I use the Photos app for this, reviewing my photos and then editing them. Here, it takes an additional step to edit your photos, via Photos or some other app. But the advantage here is that you can treat the files as files—selecting multiple files, saving them in a ZIP file, or quickly sharing images with contacts via a OneDrive link. That's a handy feature that Photos lacks. In that app, "sharing" a handful of files means Windows will simply embed them inside an email.

The one thing I don't like about the Gallery view: It's slow. I can take a photo on my Android smartphone and it takes minutes to show up, even if it can be found on OneDrive's Camera roll and in the Windows Photos app, which connects to it. I can understand a delay, but I finally gave up on looking for a recent shot and moved on.

File Explorer now thankfully unpacks RAR and 7-Zip files (fave.co/3u9mQx7), among others, which has been substantially overdue.

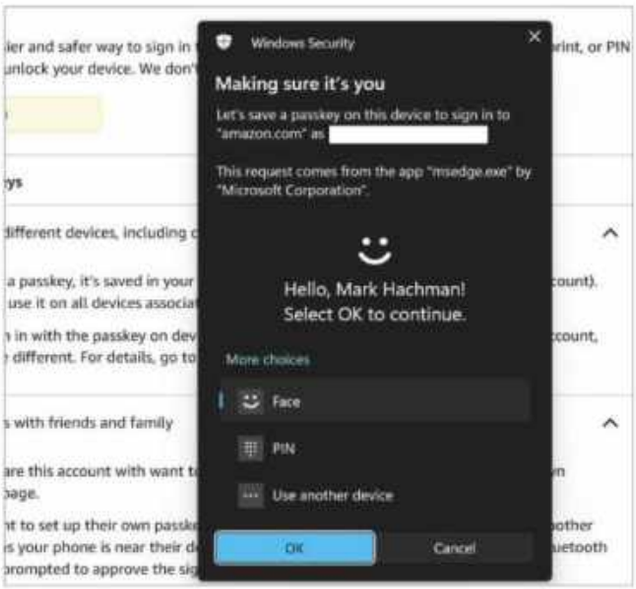
PASSKEYS ARE THE FUTURE, NOW

I love passkeys (fave.co/47aWGsi). One of the advantages of Windows Hello is how simple it makes logging in, using just your face (fave.co/3lmacXy) or a fingerprint to identify yourself. Web developers have long promised that we'll start to see those in everyday web sites, just as mobile apps are now beginning to use biometric logins as either a secondary form of identification of just a primary login. Put another way, to log in to Google, all you need to do is let Windows recognize your face. That's it!



Windows 11's 2023 Update also shows recent photos in its Gallery view.

Either way, we're *just* starting to see passkeys appear. So far, I've only seen them offered for Microsoft, Google, and most recently Amazon. Setting up a passkey can



You can now log in to services with your face.

be as simple as accepting the invitation from the web site to set up a passkey. In Amazon's case, you'll need to dig through your account settings to find the option.

Unfortunately, while Favorites and *passwords* can be synced via Edge, Passkeys currently cannot. That means that if you move from PC to PC, you'll need to reapply the passkey.

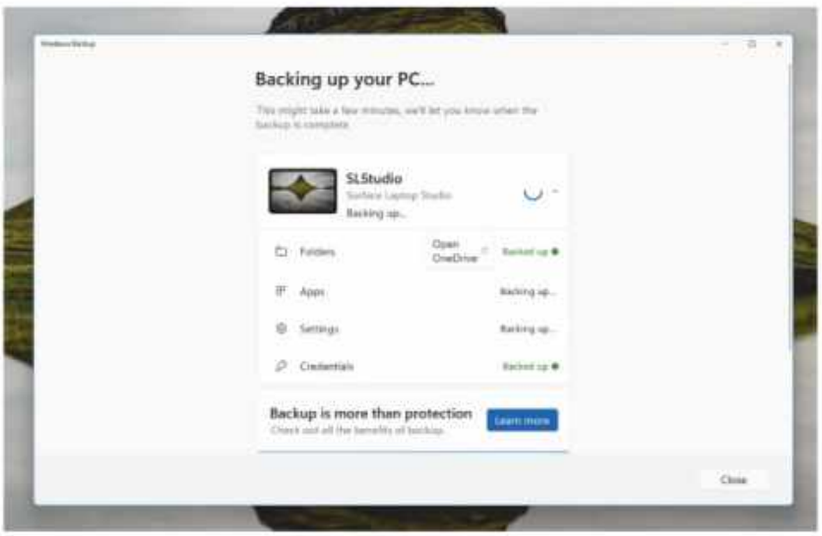
To manage your passkeys, navigate to Settings>Accounts>Passkeys within the Windows 11 Settings menu. While you'll need to sign up with a web browser, it doesn't matter if that browser is Microsoft Edge or Google Chrome; the passkeys will be saved to Windows on your PC. Supposedly Windows offers the option of using a nearby phone as a security token to provide another level of authentication, but I wasn't offered that option.

WINDOWS BACKUP AND RESTORE OVERPROMISES, UNDERDELIVERS

I can't say I love the new Windows Backup and Restore option nearly as much. I've made my feelings clear in a separate story (fave.co/3FXdC9H), but the bottom line is this: The new Windows Backup app is solid in what it promises. Backup takes your apps (but only apps that can be found in the Windows Store, mind) and stores them in the cloud. It should do the same with your documents and files.

Upon configuring a new PC, the "Out of the Box Experience" should offer to restore those apps and files. But the whole process is a mess. Videos don't carry over. Neither do games and apps you didn't download from the Microsoft Store. And I've truly begun to dislike the whole placeholder file concept, which makes me wade through numerous icons to find the files I'm looking for, unless I hide them behind some master file folder.

Backup and Restore should essentially clone my PC's drive into the cloud, then reproduce it on a new PC. It doesn't come close to that. Microsoft should either rename "Backup and Restore" to something that doesn't promise a full backup and restoration, or possibly buy a company like PCMover. (Ironically, PCMover doesn't transfer apps that can be acquired from the Microsoft Store.) With speedy broadband, downloading applications isn't that big of a deal. But with



Windows Backup is good in concept but not in reality.

games and big video files, transferring them from one PC to another can be a real pain. Windows Backup and Restore doesn't really solve that problem yet.

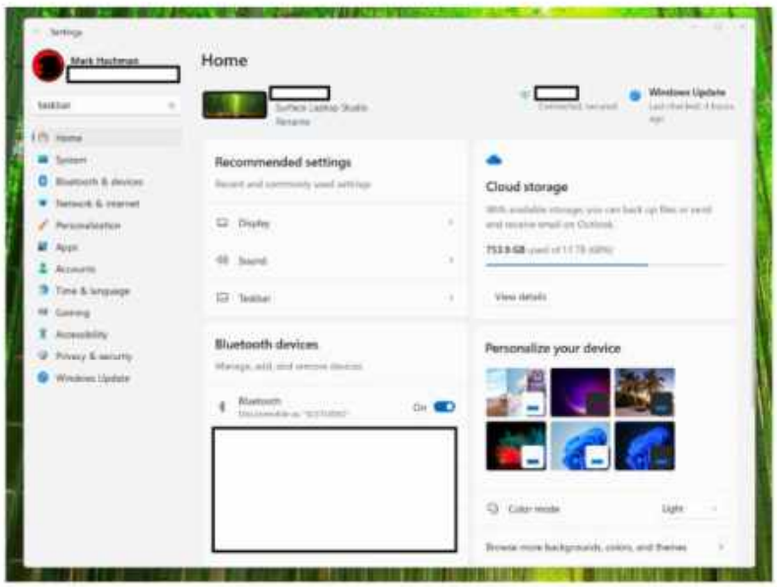
UI IMPROVEMENTS IN TASKBAR, SETTINGS, AND THE VOLUME INTERFACE

The Start menu and the Taskbar are left relatively unchanged in the Windows 11 2023 Update. Some people (me included, on occasion) like when an app pinned to the Taskbar shows you what it actually is, instead of an icon. This feature can be configured in Personalization>Taskbar within the Settings menu in the Windows 11 22H2 update: "Combine taskbar and hide labels." If you set it to "never," the icons on your Taskbar will be replaced with badged labels. (Even on a widescreen monitor, though, you won't be able to see too much.)

Microsoft has said that it will be replacing the Chat app on your Taskbar (fave.co/3QQmCDE) with the oddly named Microsoft Teams (free), complete with an overhaul and with SMS texting. It's not here yet, though.

Likewise, Settings has been improved, so that the first home page consolidates information that was previously scattered about several pages. It's a front door to changing system settings like your display, personalizing your PC's background, and managing Bluetooth devices. Some people may care that the Apps section now separates some Windows apps, labeled as "System components," into a separate page.Settings now leans a bit too much toward subscriptions—most people probably don't need a constant reminder of

Even on a widescreen monitor, using titles to differentiate your windows doesn't help that much on the Windows 11 2023 Update.



The Settings menu within the Windows 11 2023 Update is now compact and useful.

their OneDrive quota and Game Pass subscription, but it's understandable.

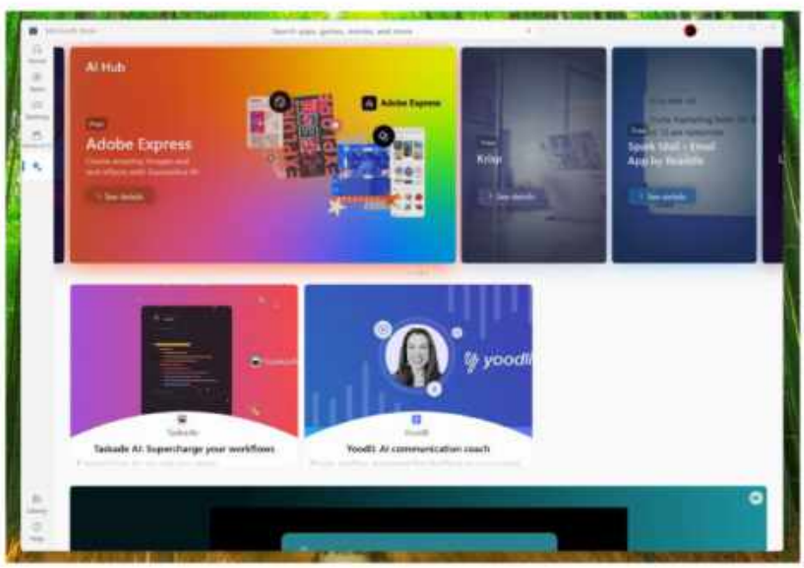
Microsoft has also provided an updated audio mixer for Windows 11, which is a step forward. You'll need to click the volume controls in the Taskbar, than navigate through to the small "wires" icon to the right of the volume bar to make any adjustments. But it's a fairly natural interface, even if it drops down a bit, forcing you to scroll down. Muting works as expected.

APP IMPROVEMENTS OVERSHADOW WINDOWS 11'S OWN

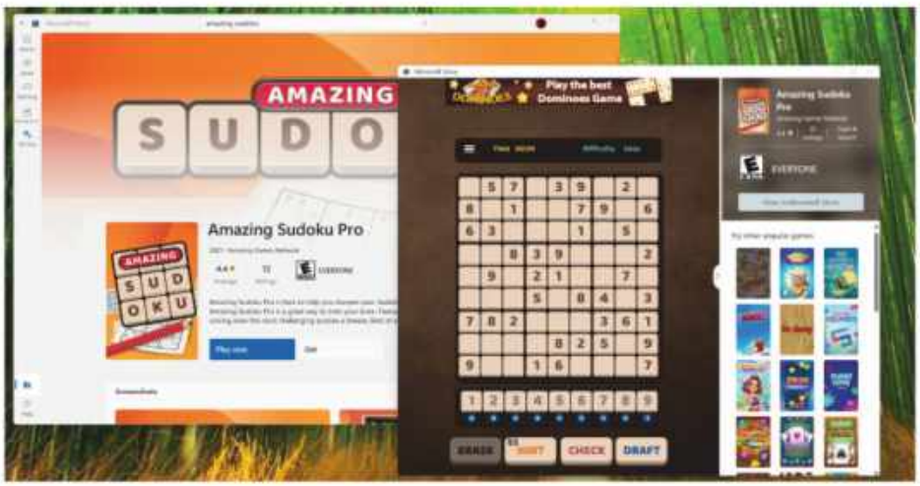
In years past, updates to various Windows apps were part and parcel of the Windows upgrade experience itself. No longer. Instead, updating your applications within the Microsoft Store app brings with it a whole host of improvements that, in this update, might just overshadow what Windows 11 now offers.

AI appears inside the Microsoft Store app, as part of an AI Hub page that indexes some AI powered apps, including ones you may have heard of (Adobe Lightroom) and others you haven't (Gamma). If you're intrigued by AI, then it's worth checking out—sort of a curated page of AI-powered apps that may become more important as AI itself does.

It's a point I've tried to make tangentially in other stories, but it's worth repeating: Microsoft cares about storing your data in its cloud, using AI to access it, and charging you



The AI Hub within the Microsoft Store is worth a look.



If you need to play a game right now, there's Instant Games.

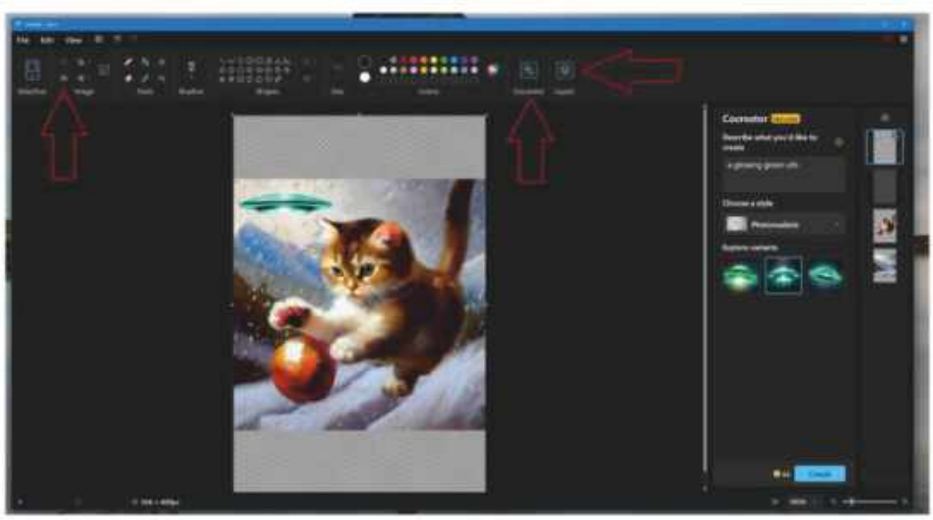
a subscription fee for the whole package. Intel, Qualcomm, and AMD are trying to sell you local AI that runs on your PC for free. The two approaches may eventually go to war with one another…or not. But it's worth keeping an eye on.

Instant Games is another new novelty: quick games that you can play right from the Store without having to install them. There's a dozen or so—but nothing that's really worth seeking out.

AI IN PAINT AND PHOTOS: WOW!

The humble Microsoft Paint has also been supercharged in time for the Windows 11 2023 Update, with three distinct improvements: layers, Cocreator, and background removal. The three go hand in hand.

Layers have been a feature of photo-editing tools for some time. You can separate a primary layer in Adobe Photoshop, where you can add a photo or illustration; in another layer, you can add a secondary illustration, such as a background. When the editing is done, you can export the image with both (or more) layers combined together. Paint now has a simple version of this, where a Layers tool allows you to construct multiple layers, then combine them together via a Merge function.



I used Paint's Cocreator to generate the cat, the snowy backdrop, and the UFO, then composited them together. Background removal is the small icon in the upper left, with the other tools more prominently displayed.

I am a *very* basic amateur artist, which means I initially struggled to use the Layers tool. Cocreator, though, helps. As the name suggests, it's an AI image creator, much like Bing Image Creator. What's odd about it, though, is that Bing Image Creator not only generates images of better quality and resolution, but works off a separate "credit" system. (Exhaust your credits, and the images are generated more slowly, at least on Bing Image Creator.) However, there are drop-down menus to choose styles, such as "oil painting," that aren't in Bing Image Creator.

The easiest and best way I found to use the updated Paint was to import a photo (or use Cocreator), then extract the subject from the background. Again, that uses AI to identify the subject of the photo—no "magic lasso" or selection necessary. I then created a background layer. All of this is a bit like the Magic Select tool that I loved so much in Paint 3D.

Photos' new background blur (top) really highlights the subject of a photo.

This is a victory for Microsoft. You're not going to get the sophisticated elements of a photo editing tool like Photoshop or Lightroom with the new Paint. Still, the update gently introduces you into lightweight AI art generation and editing, even if it's a bit obtuse for newcomers.

There's a small AI-enhanced addition to Photos, too: background blur, and it's fantastic. You're probably aware that traditional DSLRs add background blurring, or bokeh, as a natural byproduct of how a lens focuses. A digital camera or smartphone's portrait mode adds this via AI. So too, does Photos.

You'll need to select a photo in Photos, then edit it using the leftmost teeny-tiny icon above it. You'll then see the interface that looks much like it did a year ago (fave.co/3L5StLw). What's new, though, is the additional background blur option that appears to the far right. Click it, and Photos identifies the foreground subject and blurs the rest of the image. You have an option to adjust the blur function, and even unblur specific areas.

Let's put it this way: I take a lot of photos with a Samsung Galaxy S23 Ultra, and it does just an average job at identifying the sharp, distinct edge of a laptop in portrait mode. Photos does it nearly perfectly. With the Photos' Retouch "Spot fix" feature back in place to erase bits of dust and dirt, plus Auto Enhance and now Background Blur, we can hopefully bury my old Photos complaints (fave.co/3LKaRNe).

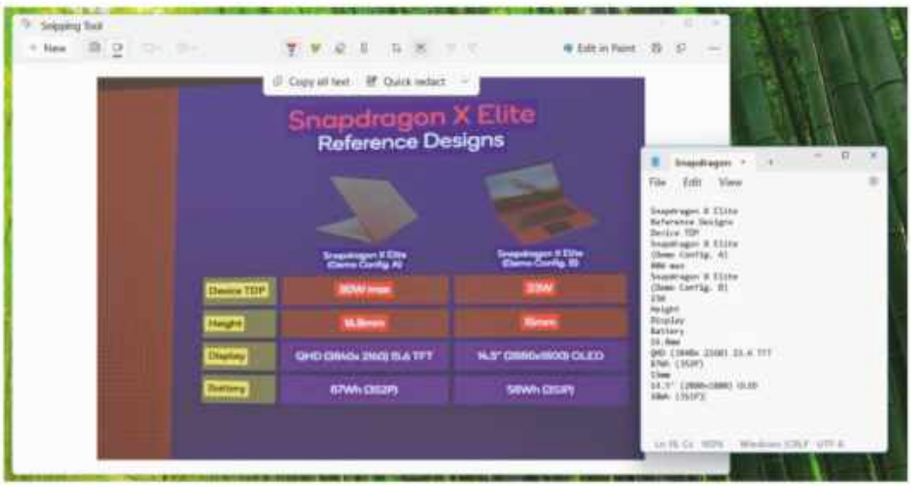
I'm going to stand up and cheer for the AI improvements in Photos and Paint. They're not front and center like Copilot is, but they're equally (if not more) important.

SNIPPING TOOL MAKES YOU FEEL LIKE A SECRET AGENT

Snipping Tool is more than just a way to capture screenshots, though that's the way I (and probably you) still think of it. But you can capture an image or video, and you can adjust the app's settings to include audio from your mic and the system sounds. In reality, you can basically record an app while you narrate what's going on. Microsoft doesn't explicitly connect the Snipping Tool to Clipchamp, but that would be the next step to edit your videos.

Snipping Tool also has a new component: the ability to extract and redact text. Windows 11 uses optical character recognition to extract text, and it does an *excellent* job when it does so. All you need to do is highlight an area on a screenshot or PDF, and the tool copies the extracted text into the copy buffer. (I didn't test this on a protected PDF, but it works just fine on a normal one.)

The app also is surprisingly intelligent when it comes to redacting text. As a test, I gave it a screenshot of a document the Consumer Electronics Association had sent



Snipping Tool does a nice job of extracting text on just casual photos—not even screenshots. Formatting, though, is still an issue.

me for CES. Snipping Tool automatically redacted my email and a personal identification number the CEA sent me. Unfortunately, it doesn't automatically identify my username when I try to take a screenshot of the Windows Settings menu, however.

This probably isn't what Microsoft had in mind, but there's an undeniable 1980s Cold War vibe that I get when Snipping Tool extracts text from a PDF or redacts personal information.

RGB LIGHTING CONTROLS

Dynamic Lighting doesn't actually qualify as a Windows app, but it's a sort of "uber app" within the Settings menu (Personalization > Dynamic Lighting) that supposedly eliminates the proprietary apps that govern peripherals with RGB lighting. Peripherals from Razer are still the favorites here, but you may find more are added over time.

Ideally, Dynamic Lighting was designed to take RGB peripherals from Corsair, Razer, NZXT, Logitech and more and provide one app to rule them all, so to speak, rather than force you to download and load apps from each manufacturer to control all of the sparkly, blinking lights. Unfortunately, it's sort of limited to a lot of modern Razer peripherals and not a whole lot else. I have an old left-handed Razer DeathAdder that I really like, but Dynamic Lighting does nothing to stop its constant pulsing.

OUTLOOK IS REPLACING MAIL

One of the reasons *not* to get the Windows 11 2023 Update is the new Outlook app (which differs from the more robust Outlook app in Microsoft 365—and no, I have no idea why there are two). You may find, as I did, that Windows finally killed off Mail and replaced it with the lightweight Outlook app. Mail did just what it needed to do (fave.co/3pQmadX), and no more, with a dense UI that emphasized the essentials.

If you try to load Mail, the app will open, crash, then be replaced by Outlook. I have no idea why Microsoft can deprecate Movies &

TV and Windows Maps (fave.co/3QW7DrS) but leave them in the Microsoft Store, but it can't do that with Mail. Please bring Mail back, Microsoft!

THINGS WE EXPECTED TO SEE BUT DIDN'T

In our introduction to Windows 11 2023 Update, we expected to see in-field inking: if you were to write "Bluetooth" in the search box, the ink would be inputted and accepted as "Bluetooth." That isn't the case, unfortunately.

Windows Spotlight appears to be the same as before, allowing you to opt in to Microsoft's selection of desktop backgrounds. We're not seeing options to up-vote or down-vote backgrounds yet. Microsoft is also allowing HDR displays to display HDR backgrounds in HDR, which appears to be the case on an HDR monitor. There's no explicit mention of this that we can find, though.

All of these features may be headed to your PC (and ours!) in the future.

BOTTOM LINE

It's been a while since PCWorld has written a Windows 11 feature update review, and a while since we've had a feature update *worth* reviewing. Windows 11 finally feels livelier and more energetic. I'm not entirely sure that Windows is headed in the direction most users care about, if only because I'm not sure Windows 11 users are demanding the AI future that Microsoft envisions.

To its credit, though, Microsoft's first attempt at an AI-infused PC puts artificial intelligence in places both high and low: as a high-profile assistant with Copilot, but also with more subtle, pointed improvements within Paint and Photos. My contacts in the chip industry feel that those very specific, localized features will be how AI PCs eventually succeed. Yes, you might walk away thinking that you'll never need all this AI junk in your operating system. I can't help but think these incremental updates will generally ease that reluctance, but it will happen over time.

If I had to deliver a letter grade, it would be somewhere around a B. Microsoft's Windows 11 2023 Update is a step toward the AI PC, providing a foundational update that Microsoft can build upon.

Windows 11 2023 Update

★★★★☆

PROS

- AI-infused apps are stars.
- Passkeys are the future.

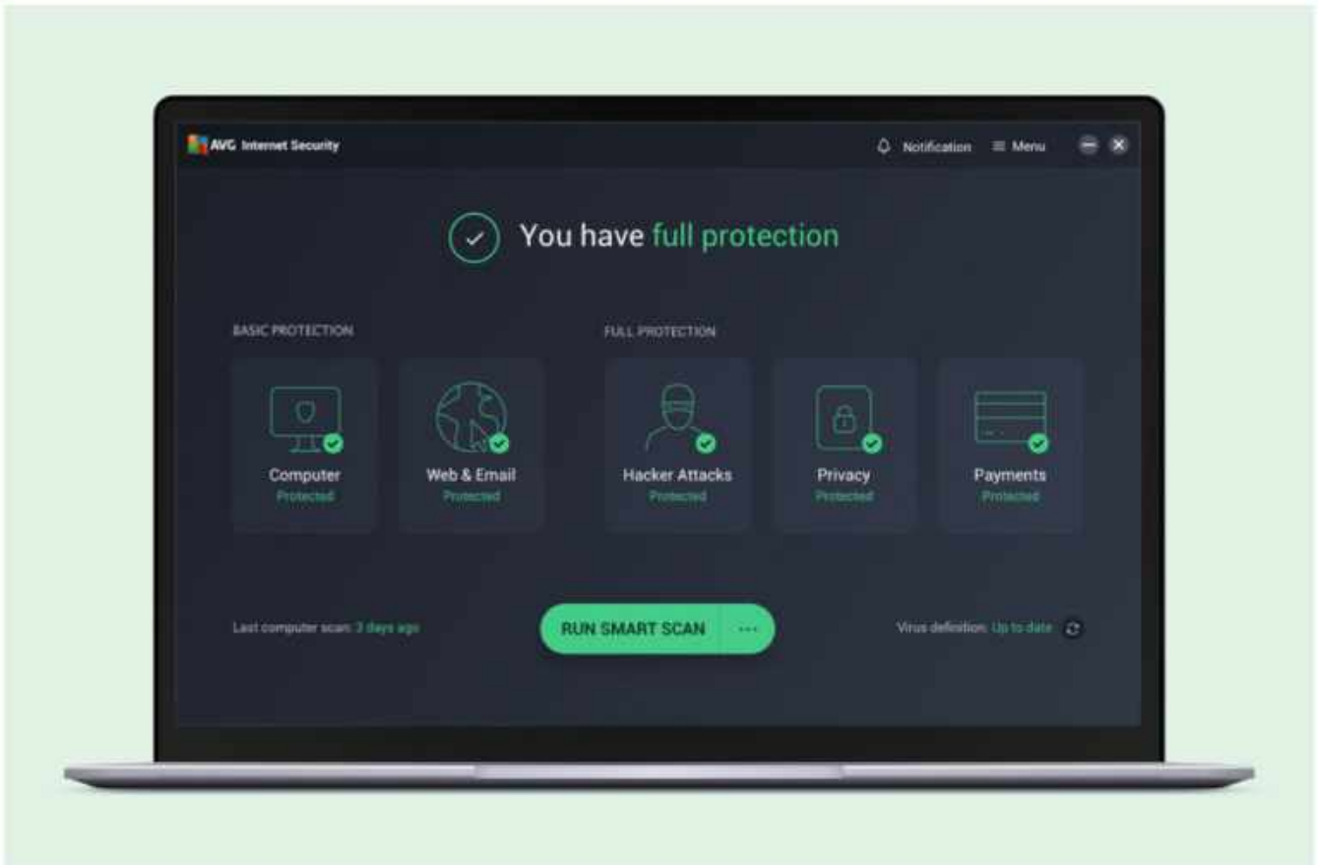
CONS

- Copilot isn't all there yet.
- Windows Backup and Restore underdelivers.
- RIP, Windows Mail.

BOTTOM LINE

Microsoft's Windows 11 2023 Update (23H2) is the most meaningful update in years, striding toward the promise of an AI PC. But it's not there yet.

Free update



AVG Internet Security: Reliable, budget-friendly antivirus software

AVG Internet Security rounds out the company's solid antivirus software with additional online protections while not costing too much. **BY ALAINA YEE**

AVG is best known for its excellent free antivirus software—so why pay a premium for the AVG Internet Security suite? In a word: convenience.

With security software, the more you pay, the more comprehensive your protection becomes. That can be valuable if you find keeping up with online threats too overwhelming or time consuming. There's something to be said for a program that can handle the major elements for you. And that's what AVG Internet Security, the company's entry-level version of its paid antivirus software, provides.

By moving up to a paid subscription, you get additional features that keep you safer during your off days. No antivirus

IMAGE: FOUNDRY

program is bulletproof, of course, but this one hits the major points while not overloading you with extras you won't use. Whether it's right for you depends on how much you prioritize simplicity.

HOW MUCH DOES AVG INTERNET SECURITY COST?

First, the basics—let's talk about cost. If purchased directly from AVG, jumping from the free plan to the company's Internet Security package is cheaper for the first year, and then reverts to the full price thereafter.

Single-device plan (1 PC)

- $47 for the first year
- $76 per year thereafter

10-device plan (Multiple devices)

- $60 for the first year
- $100 per year thereafter

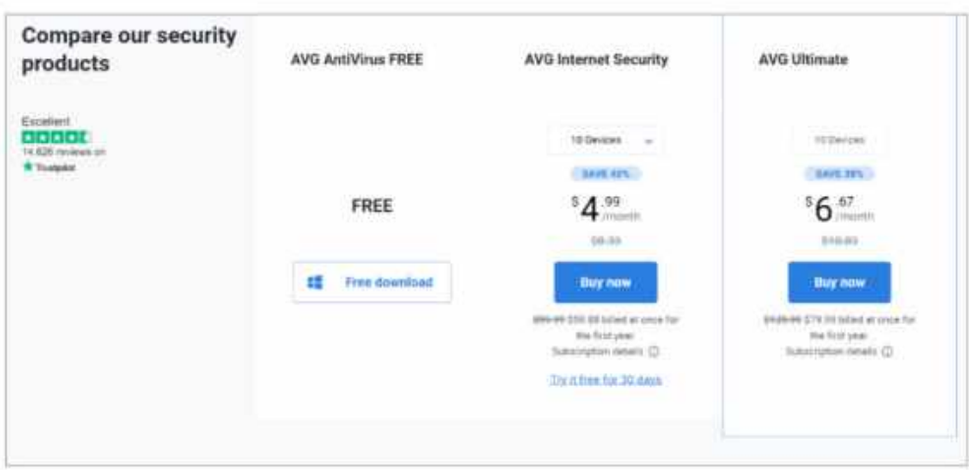
AVG doesn't offer family plans, but if you purchase a multi-device plan (which supports PC, Mac, Android, and iOS), you can share the device quota (fave.co/3SG4spE) with family members. Even if you're flying solo, the extra cash for multi-device coverage can be worth it—these days it's common to own at least a computer and phone, and often a tablet as well.

Compared to the competition, AVG prioritizes more devices rather than extra features. Take, for example, Norton—its closest equivalent plan includes VPN access, but you can only use it across five devices. Also surprising: Avast, which actually owns AVG, charges more for almost exactly the same plan.

For more savings, you can buy a license for AVG Internet Security through retailers like Amazon (fave.co/3szjvGZ) or Newegg (fave.co/3QGai7M), which offer multi-year plans as well as ones with fewer devices—so you can get a subscription appropriately sized for your situation, if you prefer.

WHAT DOES AVG INTERNET SECURITY INCLUDE?

AVG Internet Security adds five more features to the free plan's antivirus, firewall, web and email threat, and network protection. You get safeguards for the passwords saved to your



AVG's multidevice plans cost more, but you can share that limit with others.

browsers; webcam takeovers; unknown access to files with sensitive data; malicious redirects for websites you're trying to visit (aka DNS hijacking); and attacks conducted through Windows' remote desktop protocol.

This particular plan does not include access to a VPN (fave.co/3FtTTMs). AVG also doesn't have its own password manager (fave.co/3IRkfRz) or parental controls, so you can't get those by changing your subscription.

KEY FEATURES OF AVG INTERNET SECURITY

Installation and user interface

To install AVG Internet Security, either download the free version and then upgrade, or first buy the paid subscription and install afterward.

AVG's dashboard is fairly straightforward, with the exception of running other scans—though it's not obvious, you can click on the text to open the menu.

AVG's dashboard is clean and logical, though possibly gloomy for those who like light-themed apps. The nearly black background is punctuated with bright green text to cue you in to important information. Both your PC's status and key features are clearly highlighted in the dashboard.

Starting a scan from the dashboard is easy—for a quick scan, you press the Run Smart Scan button toward the bottom of the screen. You can choose a different type of scan by clicking the text that says "Run other scans." Your options are deep scan, file or folder scan, boot-time scan, USB/DVD scan, and performance scan. Using the performance scan requires a separate subscription to AVG TuneUp, or a further upgrade to an AVG Ultimate plan.

Above the scan options are the dashboard tiles. Currently, there are four tiles related to the software's features—the fifth is now reserved for the AVG store, through which you can purchase subscriptions for other AVG software not included with Internet Security. If you click any of the

main dashboard tiles—Computer, Web & Email, Hacker Attacks, and Personal Data—you'll see explanations for each of the software's components. You can also broadly customize your settings, either by toggling off a feature or by fiddling with the defaults. For the best protection, most people should leave everything on and then add items for protection where applicable.

To stay protected, leave these antivirus protections on.

However, if you run into conflicts or annoyances that require a little fine-tuning, AVG does provide more granular control. To access, you'll click on the Menu hamburger icon at the top right, then choose Settings. This drop-down menu gives access to features like the data shredder, subscription info, browser extensions, and support as well.

These detailed settings are a boon for software nerds, incidentally—particularly those of us who serve as tech support for loved ones. You can tweak a fair number of things, including privacy settings (you can opt out from data sharing right from the app), and even set a password to keep others from changing settings.

The only real issue with AVG's app is the continued upsells for its other products. If you thought that paying for AVG would stop the flow—alas, no. It only reduces the amount.

Virus, malware, and threat protection

Real-time protection

AVG Internet Security protects your PC against real-time threats in multiple ways. On your PC, the software scans files you add or open, checks apps for unusual behavior, and controls access to select folders often targeted by ransomware. Ransomware protection is customizable, so you can add more folders to the default list. Email downloaded to your PC is screened for dangerous attachments and malicious links, too.

When you're on the web, AVG Internet Security scans the data transmitted to your

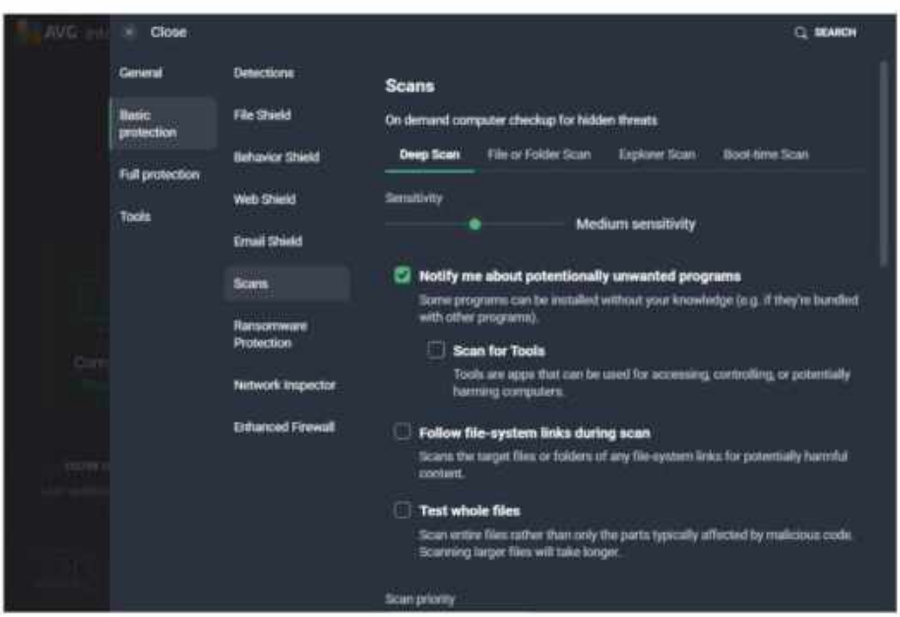
computer for malware and for any sneaky DNS redirections to fake websites. It also monitors traffic going to and from apps, and locks down the passwords saved to your browsers. You get protection from remote access attacks, too—AVG blocks remote connection attempts from unknown sources, and it restricts access to your webcam and microphone.

As a small protection against being caught unawares from data breaches, AVG Internet Security keeps tabs on your email address. If it's spotted in a leak, you'll get a notification in the app.

Scheduled and manual scans

By default, a smart scan (the equivalent of a quick scan in other antivirus software) is scheduled for once a month. You can adjust the timing and depth of scan, as well as add more scans to the list. You have four kinds to choose from: Deep Scan, File or Folder Scan, Boot-time Scan, and USB/DVD Scan.

Each type of scan is customizable in settings—for example, Deep Scan normally scans for files that are vulnerable to malware, and only for common installation apps. But you can make it dig further and have it scan all files, if you like. You can also change how the program handles infected files.



Power users can customize scan settings and get more control over how deep the screening goes.

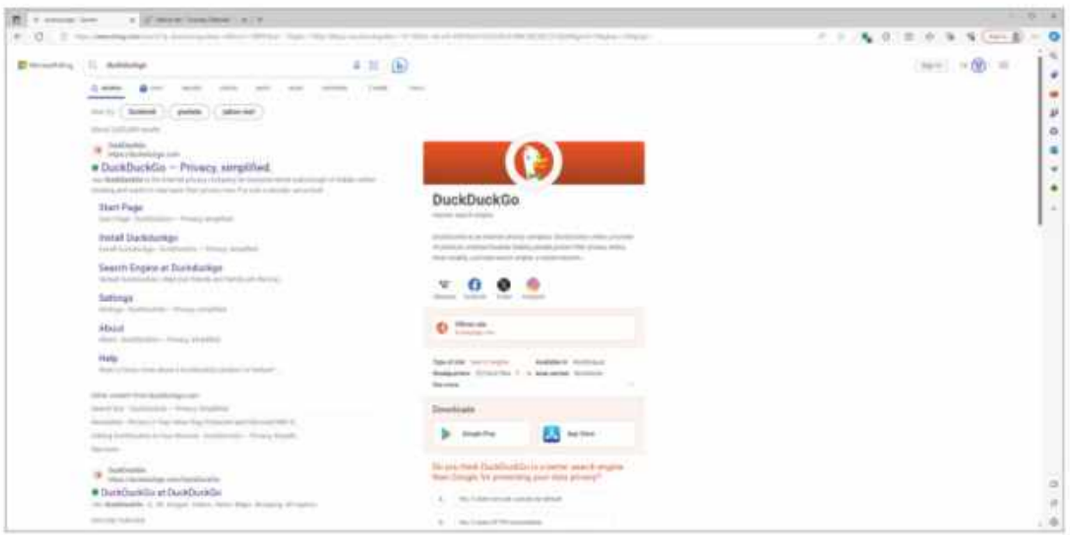
Additional features

Browser extensions

If you install AVG's browser extension, you can add an extra layer of protection while visiting websites. It'll flag unknown sites and also add status badges to Google and Bing search results. In my experience, I found it slightly overzealous at first—it threw up a warning when I navigated directly to www.google.com—but it seemed to calm down after that.

Data shredder

Formerly known as File Shredder, this feature lets you securely delete files, folders, or whole drives by overwriting them with other data. On the face of it, this sounds like a good



AVG's browser extension verifies links in search results for Bing as well as Google.

feature—and it can be, if you want to clear data from a hard disk drive (HDD).

However, most modern computers have solid state drives (SSD), which save data in a different way than mechanical drives. At best, you won't actually securely overwrite the data using this method, and at worst, you can shorten the life of your SSD. (You'll want to use this method instead: fave.co/3ueCpDw.)

Customer support

Aside from AVG's support pages (fave.co/49C7qkS) and forums (fave.co/47tzIfG), you can contact technical support (fave.co/49DfSQX) through an online chat or through a phone call. The support pages are best for quick overviews and/or walkthroughs of various features, while the forums can help with troubleshooting—provided you're willing to dig through several threads.

Updates and maintenance

Updates for both virus definitions and the app itself run automatically in the background, though you can change these to only remind you when an update is available or go full manual (which is not advised). If you want to manually trigger the update yourself, there's also a button to check for updates. You can find this by heading to Settings > General > Update.

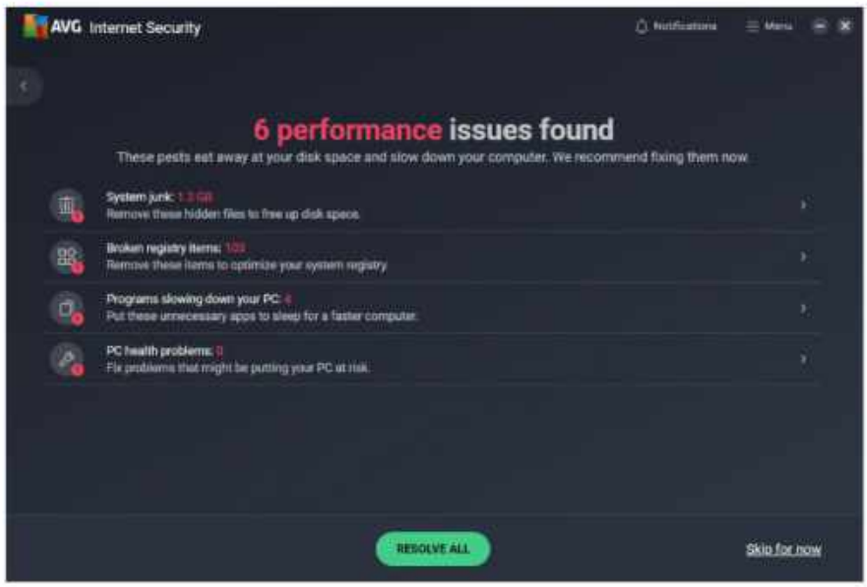
PERFORMANCE

AVG gets extremely high marks for antivirus and malware protection from leading organizations that evaluate security software. In AV-Test's zero-day attack and malware tests for July and August 2023 (fave.co/40BoO5i, the most current as of this article's publishing), AVG Internet Security detected 100 percent of the threats.

Similarly, in AV-Comparatives' real-world protection test for July through August 2023 (fave.co/47i7PYw), AVG's core antivirus component blocked 100 percent of the 254 test cases, with one false positive. When

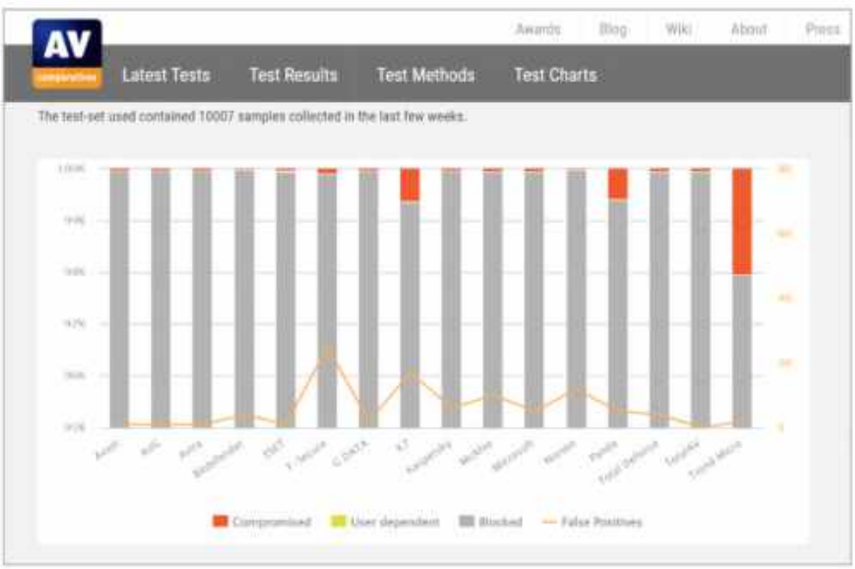
faced with 10,007 samples in AV-Comparatives' September 2023 malware protection test (fave.co/3SDzNsW), it scored a 95.3 percent offline detection rate, 99.5 percent online detection rate, and 99.97 percent online protection rate, with one false positive.

During my hardware performance tests on a modest Acer Aspire 3 laptop (fave.co/40Bp6co) with an AMD Ryzen 5 7520U processor, a 128GB SSD, 8GB of RAM, and Windows 11 Home, AVG had no tangible impact on most typical tasks performed on a PC, as simulated by PCMark 10 (fave.co/3SFGue1)—that is, video chatting, web browsing, gaming, image and document editing in free apps like GIMP and LibreOffice. Surprisingly, it also had little effect on our Handbrake encoding test.

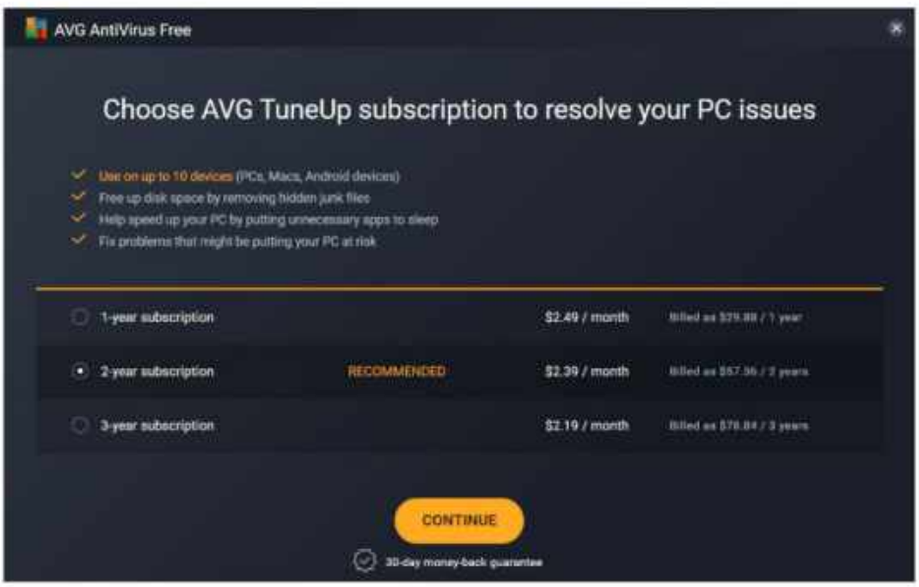


Some protections aren't actually accessible with the Internet Security plan…

However, running the same deep scan while using Microsoft Office (as simulated by UL Procyon, fave.co/3QXmyRJ) did cause a dip in performance on our budget laptop—an almost 20 percent drop. That means if you're on a cheaper PC and slinging larger data sets in Excel, you're best served scheduling your system scans for off-hours. The hit was a more palatable 9 percent decrease when AVG was left to idle in the background, keeping real-time watch for threats.



AVG took top marks in AV-Comparatives' recent tests.



…but if you click on the button to resolve them all, you get a screen asking you to pay for AVG TuneUp.

As for features, Sensitive Data Shield (which lets you scan your system for files containing high-risk pieces of personal information) was a bit hit or miss. For example, one invoice was flagged, but not another similar document that lacked the word "invoice."

Other protections aren't actually accessible with the Internet Security plan—though the interface is designed to make you *think* it is until the very last moment. For instance, running a Performance Scan will display action items. But if you click the button to resolve them all, you get a screen asking you to pay for AVG TuneUp, as shown above.

The fact that the ads don't completely cease once you start paying for AVG is a bit off-putting—it makes the app feel incomplete, even though you've got a full package.

BOTTOM LINE

AVG Internet Security is a good option for people seeking to be more hands-off with online security without paying a ton for the convenience. In fact, it's solid enough to still earn a recommendation despite how strong the free version is on its own. (And despite the continued upsells, because really, they're incredibly annoying to see in a paid product.) It offers great performance and an easy-to-understand interface along with several helpful security features.

AVG Internet Security

★★★★☆

PROS

- Top-rated antivirus protection.
- Expanded protection against malicious websites and remote attacks.
- Clean, straightforward interface.

CONS

- Some PCs may experience a performance hit during heavier workloads.
- Several features are a bit rudimentary.

BOTTOM LINE

AVG does a superb job of safeguarding your PC. It offers a clean, straightforward interface and additional online protections, while still providing the top-notch antivirus protection it's known for—and does so without charging as much as the competition.

From $47

Keychron C3 Pro: A new budget keyboard contender

With solid hardware, programming options, and an unbeatable price, the C3 Pro is an easy recommendation. **BY MICHAEL CRIDER**

PCWorld EDITORS' CHOICE

Mechanical keyboards are my favorite bit of PC accessory tech, but I wouldn't blame anyone for balking at some of their prices. A "gaming" board from a major brand starts at about $100, and more premium examples can stretch toward $300 or beyond (fave.co/3XPMP7j). The sky's the limit for custom or boutique builds, but your options for budget designs from reliable vendors are pretty limited. Keychron is ready to buck that trend with the new C series.

The C3 Pro collects a smattering of Keychron's best features with a teeny-tiny price, just $35. For that you get single-color backlighting, internal foam and a gasket mount, a choice of linear or tactile switches, and, perhaps most crucially, programming options with QMK and VIA. It's a very different beast from the keyboards that Keychron has

IMAGE: KEYCHRON

been making for the last couple of years, notably with a full plastic body and ABS keycaps. But the combination of features and quality makes it the new budget board to beat.

The red theme can be enhanced with the backlighting, which shines through the ABS keycaps.

A STUDY IN COMPROMISE

The C3 Pro is a TKL board, meaning "tenkeyless," wherein the number section on the right of a full-size design is chopped off. While eschewing the full aluminum case and rainbow lighting of Keychron's more expensive designs, this board still offers a touch of flair with red Space, Enter, and Escape keys, matching the red backlighting. (Black alternates come in the box if you want a more buttoned-down look.)

Though this isn't a gaming keyboard specifically, you could be forgiven for thinking it is, especially with the red LED flare lights on both sides. The red theme can be enhanced with the backlighting, which shines through the ABS keycaps. These are a bit smoother and cheaper than the PBT keycaps offered on many keyboards (even some less expensive ones, fave.co/3MBJpB3). But they're pretty decent double-shot plastic, meaning the legends will never wear down no matter how many TPS reports you complete.

Look closely at those legends, and you can see a bit of Keychron's legacy as a Mac-first keyboard maker. Some white printing on the Function row on the Win and Alt keys shows their Mac keyboard

Lighting comes in any color you want, so long as you want red.

The flanged USB-C cable is a little awkward.

equivalents—pressing Fn + Caps will switch to a Mac layout. Fortunately for us PC die-hards, the legends also double for the function layer for most of these keys, including media and volume controls.

Lighting comes in any color you want, so long as you want red. Again, this is an acceptable trade-off for the price, though I imagine some users would have preferred white. Fn + Q will cycle through 14 pre-programmed effects, which are pretty decent as these things go, especially with the added flair of the side lights. Fn + Tab turns them off.

The rest of the board is fairly typical. Underneath is a set of two-stage feet, very handy for adjusting the typing angle, and some much-appreciated routing for the detachable USB-C cable. (This is a feature that Keychron doesn't have on its hefty Q-series boards, by the way—presumably putting those grooves into aluminum would be much more expensive.) The cable isn't braided, and it's weirdly hard to plug in with its flanged head, but once you have it set up you don't need to think about it again.

TYPING AND PROGRAMMING

The typing experience on the C3 Pro is pretty good, and punching way above its weight class in terms of price. I'm guessing that the "Keychron branded" linear switches on my review unit are probably rebadged budget switches from Kailh or Gateron, and they're definitely not as smooth as the ones on the pricier models. But thanks to high-quality

The C3 Pro features a deep, squishy gasket-mounted deck, a rare sight at this price.

stabilizers and a little generous give from the gasket mount (fave.co/3QWLKc5), which suspends the main deck in two layers of foam, typing is downright pleasant event for extended periods. It's a little quieter than average, too, thanks to some extra internal foam.

The keyboard's layout is standard TKL, which means you can use the included keycap tool to remove the caps and supply your own, confident that they'll all fit correctly. Sadly, the switches are soldered in place, so you won't be replacing them anytime soon. Again, this is fairly typical of boards at this price (or even a much higher one), but at least one example has proven that it's doable. The plastic case also has no exposed screws, so this is not a design meant for heavy customization, either outside or in.

The Keychron can be programmed with the popular QMK or VIA open-source tools.

But there is a pretty huge advantage that the C3 Pro has over some of its budget competition, and it's why this design gets "Pro" in the name. Like some of the company's more expensive models, it can be programmed with the popular QMK (fave.co/3MHtGQS) or VIA (fave.co/47y9Sai) open-source tools. While this is less immediately necessary than it would be for, say, a 60% board, it's still a premium feature that you rarely see at this price level (even with proprietary "gaming" software, fave.co/3uacPzr). It's much appreciated.

Actually getting the more user-friendly VIA up and running for the keyboard is a little unintuitive, requiring you to load up the web interface, authorize the board, and then upload a format file (fave.co/49Di6jA). Once in place, you get a standard and function layer for both Windows and Mac configurations, which should be more than enough for everyone.

IS THE KEYCHRON C3 PRO A GOOD DEAL?

The C3 Pro is, objectively, a fantastic deal. Its combination of features and hardware at this price would be unbeatable…if it weren't for

Size is the biggest difference between the Keychron C3 Pro (pictured at bottom) and the G.Skill KM250.

one other keyboard I've tested this year. The G.Skill KM250 (fave.co/43p5Z50), at just $5 more, is definitely going for the same budget crown.

The G.Skill keyboard includes RGB lighting, PBT "pudding" keycaps, a rotary volume dial, and hot-swap switch sockets that let you customize the feel of the board to a much greater degree. On the other hand, it's lacking the VIA programming featured on Keychron's keyboard, and with its more compact size, it could really use that. It also doesn't have a gasket-mounted deck, making it a little stiffer, though it does have some of that same sound-damping internal foam.

Honestly, the biggest difference between these two boards is the most obvious one: the size. Keychron offers a standard TKL layout that's easier to get accustomed to, while G.Skill's 65% is relatively tiny, but requires a bit of user adjustment. If you're choosing between the two and it's a toss-up, go with the one that appeals based on the layout.

BOTTOM LINE

Keychron has proven that it can compete in the high-end, triple-digit segment of the keyboard market, with tons of different designs and formats. The C3 Pro demonstrates that the company can still make a great board on a budget. While it's lacking the premium switches, PBT keycaps, and flexibility of fancier keyboards, it's nearly impossible to beat dollar for dollar. Unless you absolutely need hot-swap switches (in which case, go for the G.Skill KM250), it's a fantastic choice.

Keychron C3 Pro

★★★★½

PROS

- Fantastic price for a mech board.
- Decent switches, internal foam, gasket mounting.
- VIA and QMK programming.

CONS

- Only red lighting.
- USB-C cable is a little stiff to plug in.

BOTTOM LINE

After conquering the high end of the mechanical keyboard market, Keychron didn't come to the budget segment to lose. With a combination of solid hardware and hard-to-find programming options, the C3 Pro is a fantastic choice for those short on cash or hesitant to spend big on a keyboard.

$35

Hide.me VPN: A worthy VPN service packed with features

Win the game of internet hide-and-seek with this full-featured VPN. **BY SAM SINGLETON**

Hide.me from Malaysia-based eVenture, is a VPN that might not have the name recognition of today's most popular services, but it packs just as many features. It has slowly expanded its networks in recent years to encompass more locations and add more servers.

Since our last review, Hide.me has added even more servers and almost doubled its country locations. It has also decreased the price on its longer-term

IMAGE: HIDE.ME

subscriptions and added a few power user features. So, with all of these advances, let's take another look and see where it stands in the current VPN market.

FEATURES AND SERVICES

Since our last review of Hide.me, it has changed up its interface quite a bit. Now when you open the application, you're confronted with a dashboard that shows some relevant information such as a Quick connect button that will connect to the last used server, information on your IP Address, Account information, a list of streaming optimized servers, and a list of your Favorite Locations.

Furthermore, all of these widgets are movable and interchangeable, meaning you can customize the look to only display the information you need. This is a welcome change of pace from the more simplistic home screen of old that only displayed an Enable/Disable button in the center.

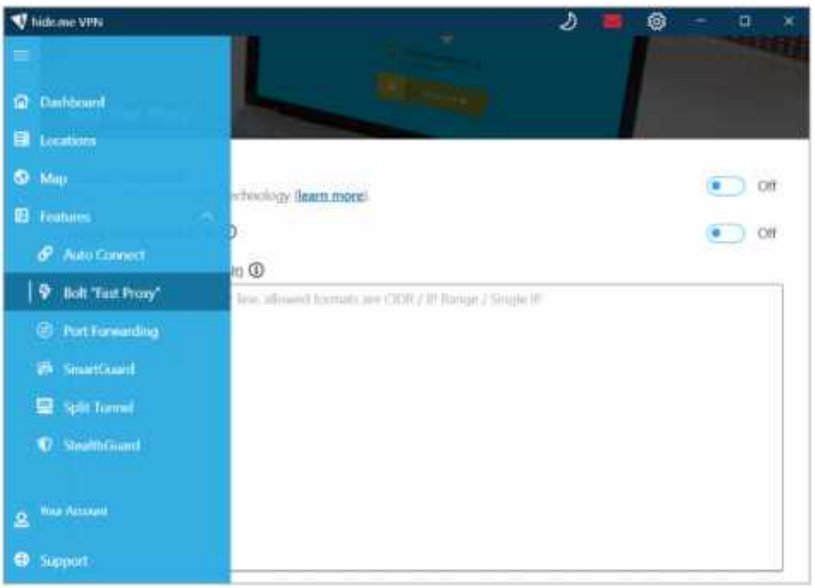
On the left sidebar you have additional tabs for Locations, Map, and Features, as well as Your Account and Support. The Locations tab displays a searchable list of all available Hide.me server locations with especially fast 10G servers tagged with an icon next to the server name. Along the top you can filter through all servers, those optimized for streaming, or Multi Hop servers as well. For those who are more spatially inclined, the Map tab displays the physical location of all of these servers on a world map instead.

The Features tab is where Hide.me really shines—there's a lot here. There are the usual options to launch on system startup, connect automatically, and so on. It also introduced a feature called Bolt Fast Proxy, which optimizes internet speed performance over an OpenVPN connection. Theoretically, this should lead to huge speed increases, particularly in Windows—I personally didn't notice much of a difference during my testing.

There is also an option to set up Split Tunneling and its own complementary proprietary firewall feature, Stealth Guard. This can be used to limit either an app or your entire internet unless a Hide.me VPN connection is present, thereby eliminating IP address leaks should your connection falter. There is also a separate Kill Switch feature available as well under the settings menu.

Hide.me even offers more unconventional tools such as port forwarding and protection from DNS, IP, and IPv6 leaks. Like I said, this service has a lot of features. Add to that the vast array of protocols available and the option to use custom DNS, and it quickly becomes apparent that Hide.me is a power user's dream.

With all of that said, due to the sheer amount of available features and the maze of menus you need to work through to tweak all of them, this service probably isn't for beginners—or the faint of heart. I personally found navigating the app a bit disorienting. I



Fast Proxy optimizes internet speed performance over an OpenVPN connection.

do like the recent revamp to its older simplistic interface, but I can't help but think that it went too far in the opposite direction. It's a minor gripe, though, and figuring out the menu system is only a matter of spending some time in the application itself.

Hide.me is available for Windows, Mac, Linux, Android, and iOS, as well as some consoles and smart TVs. There are also browser add-ons for Chrome and Firefox that come with support for the SOCKS proxy.

Finally, it's worth noting that Hide.me has a handy free version that provides all of the great security features of its premium counterpart. The only downside is that you're limited to 10GB per month and it only provides access to eight of its servers. Due to these limitations, I don't recommend using the free version to stream, but it's a great way to browse securely or just try out the service to see how you like it.

PERFORMANCE

To test Hide.me's performance, I rated connection speeds across its servers in five different countries all around the world for multiple days and then compared them to my baseline internet speed. Across all locations tested, the speeds averaged just over 31 percent of the base download speed and 67 percent of the base upload speed. That's okay, but short of our list of the fastest VPNs (fave.co/3OWgSrf).

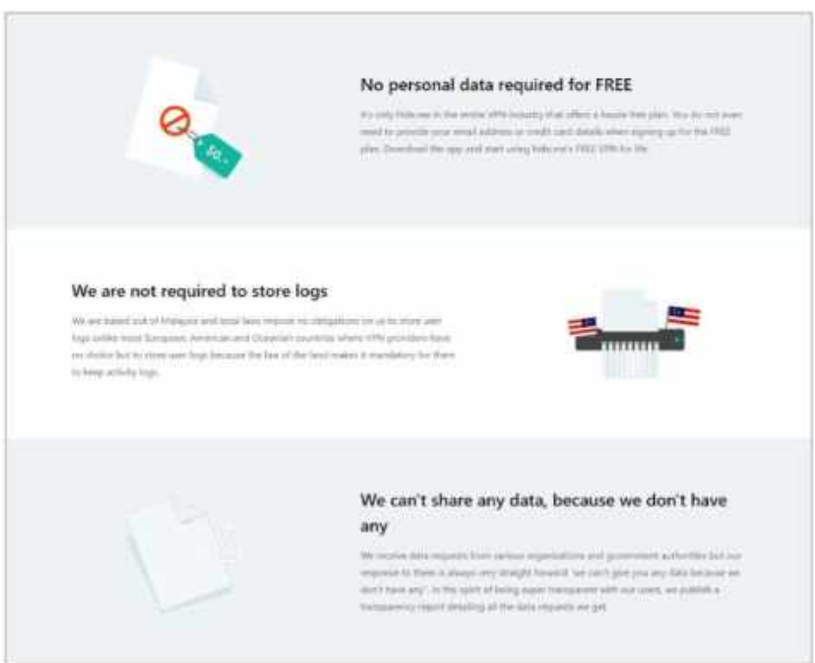
Within that aggregate, however, were some truly incredible speeds. I just found they weren't consistent. It was quite common for each location to show some great relative speeds one day and then fall off completely the following day. I also found that the drop in speed was quite significant the further the Hide.me server was from my physical location. This is of course not uncommon, as distance tends to affect ping, but it was so drastic in some instances that it caught me a bit by surprise.

Please note, however, that online speeds can vary wildly in pure Mbps tests from day to day and even hour to hour. It's best to take any and all speed tests with a grain of salt.

Your experience with Hide.me may differ from those in the tests for this review.

Despite all of this, I never really ran into any major problems with using the service to stream video or download files. Therefore, I'm confident that Hide.me has enough speed to take care of just about anything you need to do over a VPN connection.

In regard to streaming, Hide.me performed admirably. Every optimized streaming server I connected to was able to access streaming sites such as Netflix and Amazon Prime. I even tested its non-optimized servers and they had no issues either. Due to the inconsistent speeds, I did find that my video tended to drop in quality for very brief periods of time. Still, Hide.me should serve you well for streaming and getting around regional blocks.



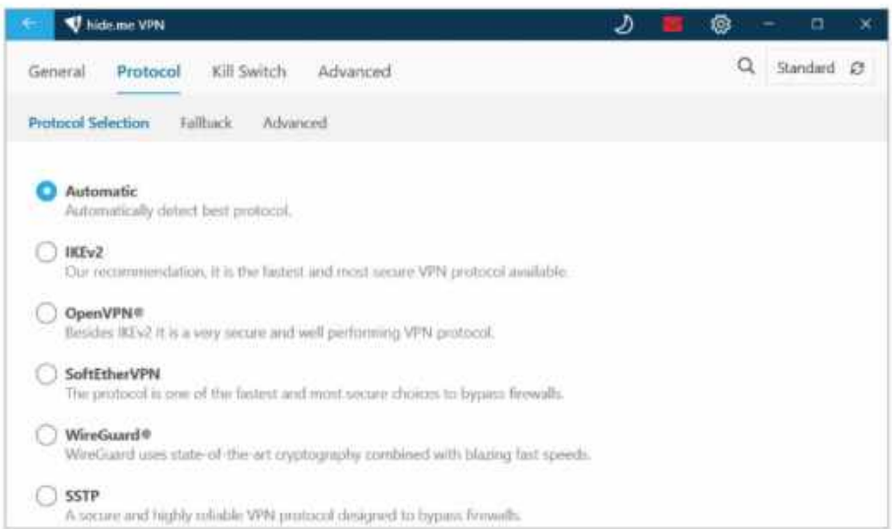
Hide.me's webpage lays out its privacy and security features.

SECURITY AND PRIVACY

Hide.me has a very thorough privacy policy (fave.co/476LCMK) on its website. It states that it does not track your activity when you're connected to the VPN. It doesn't keep connection logs or store IP addresses. The company does keep troubleshooting logs that include a randomly generated username and an internally assigned IP address for each user. The troubleshooting logs are erased every few hours, according to the privacy policy. Additionally, it logs monthly data traffic amounts for quality assurance purposes.

The company did pass an independent security audit of its No-log policy by Defense Code, but that was in 2015. Unfortunately, a more recent audit has not been completed since that time. The fact that it was one of the first VPN services to undergo an independent audit shows that it takes privacy seriously. But seeing as how many VPNs are now undergoing audits every year or two, an updated version would go a long way toward assuring users that Hide.me is continuing to maintain its privacy commitments. Having said that, it does publish annual transparency reports (fave.co/40CkmTQ) detailing all the data requests the company has received in a given year.

The VPN itself comes with industry-standard AES 256-bit encryption. It also offers a whole range of protocols including IKEv2, OpenVPN, SoftEtherVPN, WireGuard, and SSTP—that's more than most other services. Furthermore, it even offers advanced configuration options for many of these protocols to add to the customization. And in my testing I found there were no IP address leaks when using Hide.me across any of its servers and protocols.



Hide.me's wide array of available protocols.

When signing up for Hide.me, you do have to provide personal billing information, and it accepts payments via credit card, PayPal, Google Pay, and various cryptocurrencies.

BOTTOM LINE

Hide.me is a really intriguing VPN service. On the one hand, it offers fantastic tools to help power users tweak and configure to their heart's content. On the other hand, it can't quite nail down some really basic things that you want from a VPN, such as consistent speeds across servers and a user-friendly interface.

It makes all of the right privacy promises, though, and the service was able to unblock all the streaming sites that I tested. Overall, it's a well-rounded service that ticks almost every box you could want from a top VPN. I can easily recommend it for experienced power users, but beginners might want to try the free version first before committing to the premium service.

Hide.me VPN

★★★★½

PROS

- Good option for streaming.
- Better-than-average overall speeds.
- Lots of power user options for customization.

CONS

- Third-party audit not updated since 2015.
- Speeds were inconsistent in our tests.

BOTTOM LINE

Hide.me comes with a wide variety of features that can be tweaked, making it a good option for those looking to customize their VPN experience. It also has good overall speeds and a handy free version. Some minor interface snags and speed inconsistencies hold it back a bit, though.

$60

Amazon Eero 6 Mesh Wi-Fi: Fast and friendly

Amazon's Eero 6 Mesh Wi-Fi takes what the original system did so well—and adds rocket fuel. **BY THOMAS NEWTON**

PCWorld EDITORS' CHOICE

The Eero 6 is a whole-home mesh Wi-Fi system from the Amazon-owned home networking company.

The original Eero (fave.co/479ooFR) made waves when it arrived, as it offered customers struggling with wireless not-spots in their home a simple and effective solution—multiple hubs providing blanket coverage while using the same network name.

While lots of other networking devices have offered exactly the same service in recent years, Eero's proprietary TrueMesh technology, which aims to redirect connections to devices as and when required, and the clean and user-friendly interfaces, not to mention attractive prices, made the first generation of Eero stand out.

One thing that was missing was support for Wi-Fi 6 (fave.co/40GQcyP), which is faster and offers more reliable Wi-Fi connections than the Eero's Wi-Fi 5. As its name suggests, the Eero 6 addresses this. Another nice addition is an integrated Zigbee hub, which makes it easier to use Alexa to connect with compatible smart home devices—previously, if you wanted to do this with an Eero, you'd need to buy a separate hub.

IMAGE: AMAZON

IS THE EERO 6 STILL WORTH BUYING?

With a lot of other Wi-Fi 6 mesh systems available to buy now, the Eero 6 has some stiff competition. However, nothing changes the fact that any Eero mesh system is still amazingly easy to install and manage using the Eero app.

The fact that some features are locked away behind a subscription (fave.co/47taCh1) is a frustration that will almost certainly never go away, and it's one reason to look elsewhere, as plenty of rivals don't have any kind of subscription: You buy your mesh kit and it's yours to keep and use.

That doesn't really answer the question here, of course. To keep it simple: Yes, Eero 6 is still a great buy. In fact, at the time of writing this, it was ranked third in our U.K. sister site TechAdvisor's best mesh Wi-Fi systems (fave.co/3FWq4GP).

The other potential reason you're here reading this is because you've spotted the Eero 6 in one of Amazon's regular sales and are wondering whether it's a better buy at a lower-than-usual price. Again, the answer is easy: Yes, it's worth it, and especially if you're buying the three-pack, because you're saving on all three units.

The only wrench in the works is that you might consider opting for the Eero 6 Pro (fave.co/49Dt0FZ) instead if it is similarly discounted in a Prime Day or Black Friday sale. After all, if you were considering buying the Eero 6 at full price, the tri-band Eero 6 Pro is a better all-round system that may well be on sale for around the same sort of price you were going to pay anyway.

DESIGN AND BUILD

The Eero 6 units don't look like your typical home networking gear. Instead of blocky, angular shapes with big antennae poking everywhere, these devices are stout little cuboids with gentle curves and shiny white plastic jackets.

Measuring a mere 3.9×3.8×2.4 inches (99.4×97×61.4mm) each, they're dinky little things that hardly take up space on your desk. They look more like smart plugs without the pins.

Like all mesh Wi-Fi solutions, the Eero 6 hardware consists of a main unit—the Eero 6 router device—and several satellites, or extenders. The only physical difference between the router and the extenders is that the router has two Ethernet ports, while the extenders have none.

The review unit I was sent was a three-pack, consisting of one router and two extenders.

As the name implies, the router is the device you'll connect to your existing modem with an Ethernet cable, and for all intents and purposes it can act as a standalone router. The extenders are the items you'll dot around your home after you've finished setting up the router, allowing you to extend coverage to those parts of your home where better Wi-Fi coverage is needed.

The review unit that I was sent was a three-pack, consisting of one router and two extenders.

Eero promises us that this setup is powerful enough to provide solid Wi-Fi coverage across approximately 4,950 square feet (or 460 square meters) of home space, while a single unit will cover around 1,500 square feet (140 square meters). Interestingly, this is the same level of coverage that the original Eero system gives you as well.

The system is set up so that you can add more routers to your home network in lieu of extenders, should you need more Ethernet connections, meaning they act like wireless powerline adapters.

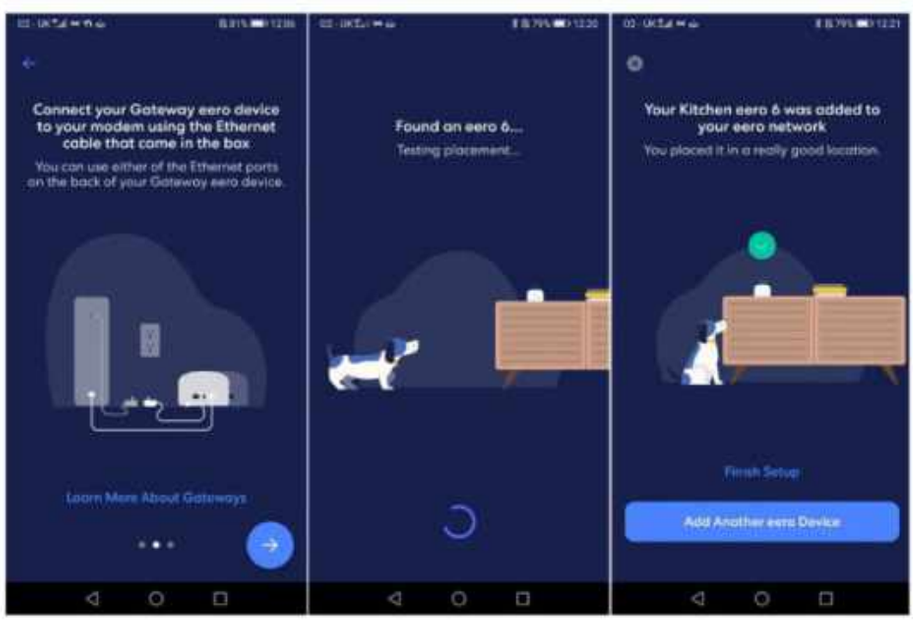
If you want to use a wired connection for your TV set-top boxes, games consoles, desktop PCs, NAS drives, and the like, you'll need to consider getting an Ethernet bridge too—or pick up a mesh Wi-Fi system that gives you more ports.

SETUP AND FEATURES

The Eero 6 uses the same simple setup process that the original Eero does. This is good news, especially if you've never installed any home networking equipment before.

You'll need to download the Eero app (iOS, Android) to get started. This guides you through every step of the process, with clear instructions and helpful animations.

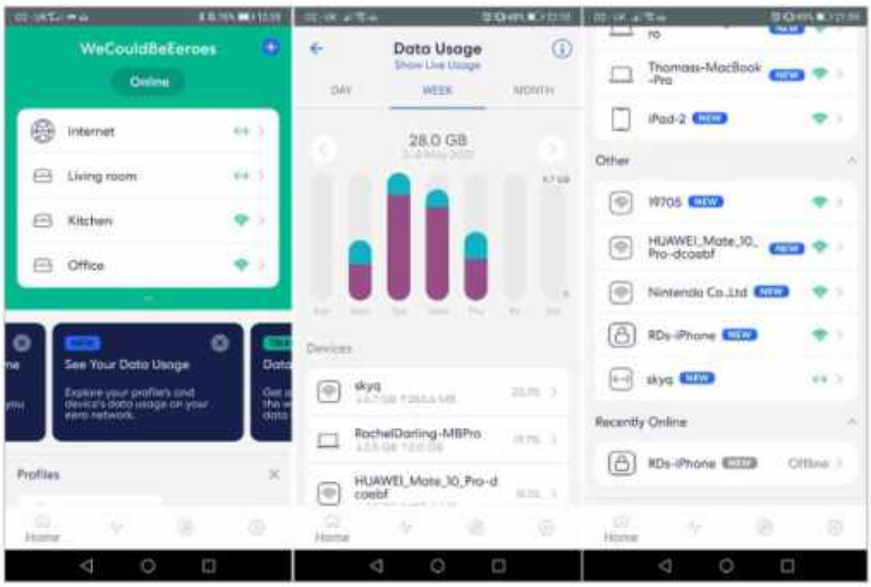
Setting up a home network isn't exactly what I'd call fun, but Eero has done a good job of making it kind of enjoyable—a cartoon dog will help you "sniff out" good spots for Wi-Fi coverage, and the app will cheerily tell you if you've picked good locations for everything.



A cartoon dog will help you "sniff out" good spots for Wi-Fi coverage.

You'll be asked to pair each Eero device with your phone via Bluetooth during setup, but if that doesn't work for whatever reason, you can manually input the serial number of each unit.

Once the Eero router is up and running, you'll be able to give the network a name, as well as create a password for the network (so people can connect to it) and the admin password (so you can log in from a desktop device to configure settings in the future).



Features include a usage dashboard that lets you see which devices on your network are the most data hungry.

You'll also need to tell the software which room in your house you're setting up the Eero router in, such as your living room. When it's time to set up the satellites, you'll do the same thing—kitchen, study, bedroom, and so on. This helps you see at a glance which devices are connected to the internet throughout your house when you're using the app.

From here, you can tap on a specific device, like "Tom's MacBook," see which access point and radio frequency it's using, and if needed assign each device to a personal profile. This lets you apply content filters to specific devices, and schedule pauses, if you want to do things like enforce homework hours (assuming no internet is required).

Setting up a guest network for when you have visitors is also a breeze, as is doing basic things like changing the network name and password.

Features include a usage dashboard that lets you see which devices on your network are the most data-hungry—handy if you're keen to know which of your roommates has been caning your connection with Steam downloads.

The old Eero Secure and Secure Plus subscriptions have been dumped in favor of a single one called Eero Plus (fave.co/47taCh1). This provides features you'd see in parental control software or other apps, such as content filters and ad blockers.

The more expensive Plus option used to throw in extras like an account for password manager service 1Password, the Encrypt.me

WI-FI 5 TEST

	VIRGIN MEDIA SUPER HUB 3	EERO 6 MESH WI-FI
1m	704Mbps	778Mbps
5m with wall	212Mbps	566Mbps
Upstairs, near the rear of the house	38Mbps	341Mbps
Garden	8Mbps	141Mbps

WI-FI 6 TEST

	VIRGIN MEDIA SUPER HUB 3	EERO 6 MESH WI-FI
1m	702Mbps	1180Mbps
5m with wall	490Mbps	560Mbps
Upstairs, near the rear of the house	62Mbps	742Mbps
Garden	8Mbps	238Mbps

VPN, and Malwarebytes anti-spyware software. But this is all now included in the single Eero Plus subscription.

If you've got any Alexa-compatible devices, you can also manage them through the Eero app too, thanks to the Eero 6's built-in Zigbee hub. I wasn't able to test out this particular feature in my review, as I don't have any voice-activated hardware, Alexa or otherwise, at home.

Finally, you can play about with extra features in the Eero Labs section of the app.

PERFORMANCE

Here's where you'll see the main difference between the Eero 6 and the Wi-Fi 5-only Eero hardware. I performed multiple speed tests throughout my home with two devices, a Huawei Mate 10 Pro, and a RealMe X50 Pro—phones with Wi-Fi 5 and Wi-Fi 6 antennas, respectively. The results below are mean averages, rounded up. I'm using a Virgin Media Super Hub 3 (which I've set to modem mode when using the Eero 6) for comparison.

While it's not an apples-to-apples comparison—the Super Hub 3 is just one dual-band router versus a mesh Wi-Fi product—the numbers demonstrate the benefits of using a multi-hub system instead of a standalone device:

As more and more devices hitting shelves now feature Wi-Fi 6 radios, your best bet is to look at the Wi-Fi 6 set of scores—anything new you buy this year phone or laptop-wise will likely be Wi-Fi 6 compliant. All your older devices with Wi-Fi 5 radios will still be able to connect to the Internet via the Eero 6; they'll just do so at slower speeds, so refer to the Wi-Fi 5 table.

It's worth noting that the first two speed tests here were taken while I was connected to the main Eero 6 router, which I'd set up in the living room. The drop in speeds can be attributed to the fact that there's a brick wall between the router and the test devices, and the fact that I was in both cases switched to the 2.4GHz radio band.

The third test result was recorded while connected to the Eero set up in the office, toward the back of the house and connected to the 5GHz band, while the garden test, taken while standing 10 feet away from the

nearest access point in the kitchen, saw me default to the 2.4GHz band again.

I really like that the Eero 6 very quickly moves you to whichever radio frequency is the most appropriate, depending on where you are in relation to an access point—the 5GHz radio frequency is notoriously not great at reaching through walls, whereas the lower 2.4GHz frequency is.

It's slower, however, at handing over between the individual points themselves. For example, when walking into the kitchen from the living room—in other words, walking from one room with an Eero into another—I'd find that wireless speeds would drop and I'd still be stuck on the living room access point, even though I was standing literally just inches away from the kitchen access point.

The switchover would happen naturally after a minute or so, but if you're a little impatient like I am, you'll find it's faster to simply disengage Wi-Fi on your phone, and turn it back on—your device will then connect to the nearest access point.

PRICE AND AVAILABILITY

Buyers can get a single router directly from Eero for $89.99, or $199.99 for one router and two extenders. Alternatively, if you want more Ethernet ports, you can get three routers for $249.99. You can also get it from Amazon (fave.co/47vPner) and Best Buy (fave.co/3swUdt4).

BOTTOM LINE

The Eero 6 offers fast Wi-Fi speeds, provides excellent whole-home coverage, works right out of the box, and is competitively priced.

It's a simple and effective solution, aimed at people who don't want to spend forever tinkering with Wi-Fi extenders and network names. Extra features, like Eero Secure security software, are there and ready should you want to use them, adding value for buyers who want to be able to secure their home network with minimal fuss.

You can get cheaper standalone Wi-Fi 6 routers, but that's not likely to give you whole-home coverage in anything but a small flat or apartment. The lack of Ethernet ports on the extenders means this isn't suitable for everyone, and if you do need those, you should have a look at the Linksys Atlas 6 system (fave.co/49u3ZNr).

Amazon Eero 6 Mesh Wi-Fi

★★★★½

PROS

- Fast speeds.
- Compact design.
- Very user friendly.

CONS

- Ethernet only on gateway.
- Handover times.

BOTTOM LINE

The Eero 6 offers fast Wi-Fi speeds and robust whole-home connectivity for a very attractive price. Incredibly easy to set up and use with lots of handy features via the well-made app.

$129

10 MUST-KNOW PC SECURITY TIPS THAT KEEP YOU SAFE ONLINE

IMAGE: ALEXANDER SUPERTRAMP/SHUTTERSTOCK

CRIMINALS ARE ALWAYS FINDING NEW WAYS TO STEAL CONFIDENTIAL INFO AND SMUGGLE IN MALWARE. THESE TIPS CAN HELP KEEP YOU SAFE.

BY ROLAND FREIST

Staying safe online doesn't mean having to learn coding or anything exotic. Germany's Federal Office for Information Security recently published a brochure entitled "Using the internet safely" (fave.co/3G3iKsl) that contains 10 helpful security tips you should keep in mind while surfing the internet to protect yourself from fraud and computer viruses. The basic information is handy indeed, but we've expanded on these tips with recommendations on specific tools and security settings you can use to stay safe online.

ALWAYS KEEP WINDOWS, BROWSERS, AND APPS UP TO DATE

Tip 1: *"Set up your web browser securely and keep it up to date. Browser extensions should be disabled or uninstalled if necessary."*

Google Chrome, Microsoft Edge, and Mozilla Firefox check for available updates every time they are started and install them automatically. This applies to Windows as well as Android and iOS devices. Refrain from experimenting with alternative browsers from dubious manufacturers. These programs are often not carefully maintained.

Even among the browser extensions in the manufacturers' stores, there are quite a few candidates for which it is unclear what information they access and to whom they pass on this data. So you should install as few extensions as possible. For most users, the only thing that is almost indispensable is a password manager. These programs are now mostly offered in the form of browser extensions. Our guide to the best password managers (fave.co/3IRkfRz) can help you find a great one.

Tip 2: *"Keep your operating system and other software up to date by allowing updates to be installed automatically."*

Windows, Microsoft 365, and many other applications have an automatic update mechanism that installs new versions and patches as soon as they appear. For all other

The Sumo update manager determines the version numbers of installed programs and compares them with its database to detect outdated software.

programs, there are tools such as Sumo (fave.co/46i99sO) or Iobit's Software Updater (fave.co/3QzBQMd) that check the version numbers of installed programs and indicate available updates.

You should use an antivirus suite such as Norton 360 Deluxe (pictured).

Tip 3: *"Use applications for virus protection and a firewall. Some operating systems already offer such applications, but they must be activated."*

Windows includes virus protection and also a firewall, both of which are active by default, but they're basic and they aren't very configurable. The best antivirus software suites (fave.co/3CnDHuk) include protect against threats like ransomware, phishing, and stolen identities.

Tip 4: *"Create different user accounts and, if possible, refrain from using the device with administrator rights."*

Under Windows 10 and 11, you normally work with limited user rights. Even malware that has crept into the system only ever gets the rights that the current user has. It therefore does not have unlimited access to the system settings and cannot manipulate them. That's why *not* using an admin account is one of our five easy tasks that supercharge your security (fave.co/49yEUAQ).

If you need administrator rights—for example, if a setup program wants to access the protected folders C:Programs or C:Programs (x86)—the Windows user account control jumps in and asks you for permission. You can find it in the Control Panel in the icon view under User Accounts—Change User Account Control Settings. For maximum security, set the slider to the highest level and confirm with OK.

Tip 5: *"Protect both your local user accounts and your online accounts with strong passwords. If possible, use two-factor authentication in addition."*

A secure password should be at least 16 characters long and should consist of

uppercase and lowercase letters, numbers, and special characters. But again, you should really manage your passwords with a password manager (fave.co/3IRkfRz) and never use one password for multiple services.

With two-factor authentication (fave.co/41SY7rQ), which is already mandatory for online banking and some other accounts, you create an additional hurdle for hackers and criminals. The authentication apps from Microsoft and Google have proven themselves as key 2FA options.

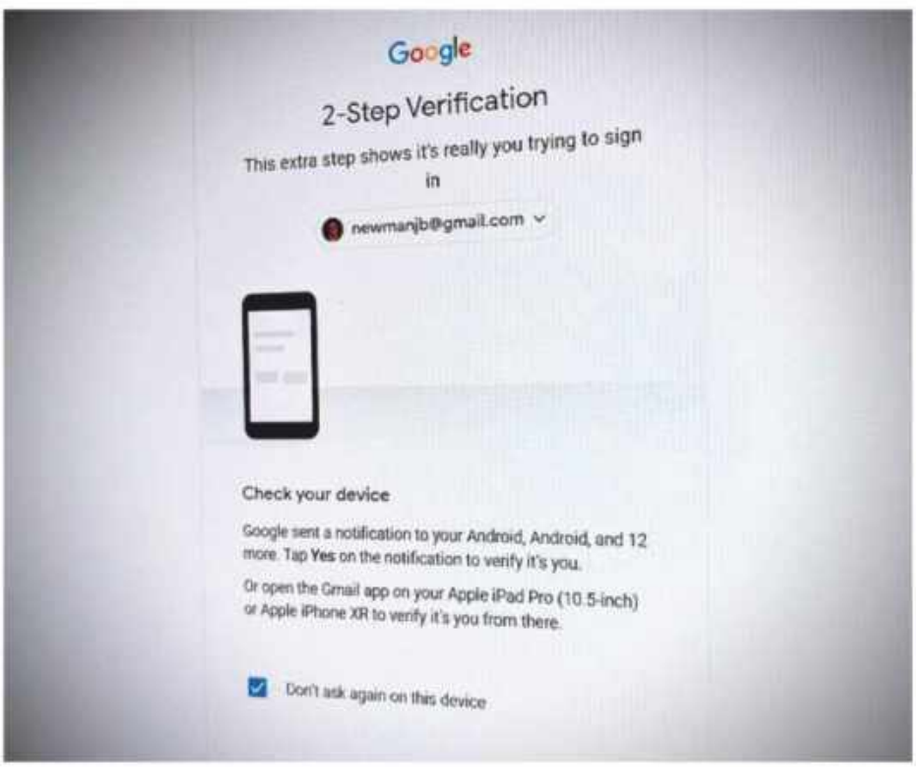
A newer technology called passkeys (fave.co/47aEq2I) uses the crypto chips in smartphones or PCs as a secure key for services, making many passwords superfluous. Google, Microsoft, Apple, Amazon, and many password managers have already deployed passkey options.

Tip 6: *"Be careful with mails and the attachments and links they contain. They are also used to infect devices with malware or to grab data."*

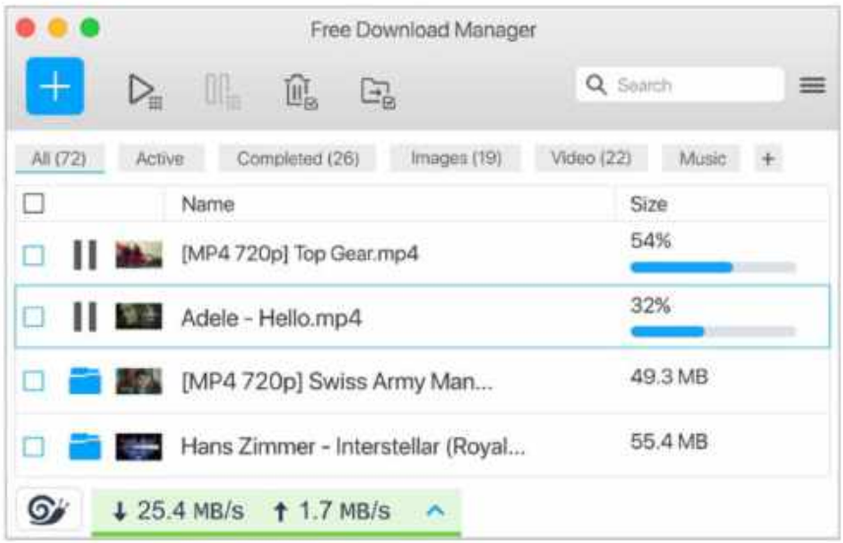
Phishing with fake emails is a preferred methods for criminals to spread malware and spy on access data. Either links lead to equally fake websites where you are supposed to enter your data, which the criminals then tap, or an executable file is hidden in the attachment, which infects the computer with malware when opened. With the small, free add-in Attachment Scanner for Outlook, you can upload mail attachments with two clicks to Virustota (fave.co/3LwgFsw)I, a Google service that checks the files for malware with several dozen scanners.

For more help, be sure to read our guide on how to spot scam emails and texts (fave.co/3QxI5Bc).

Tip 7: *"Be careful with downloads, especially if they are programs. It is best to download them via the manufacturer's sites."*



Two-factor authentication provides extra protection against hackers.



Free Download Manager has an option to automatically scan downloads.

Avoid websites that offer illegal versions of commercial software, such as software where the request for the license number has been removed, or cracks that allow you to skip authentication checks. That sort of software is often contaminated with viruses that immediately take root on your PC. Only download programs from trustworthy sources and scan the downloads with an antivirus program.

On that note, do not click on Google ads for antivirus downloads (fave.co/47ixK2g). They're dangerous and hackers often abuse them. Scroll down to the legitimate organic search link instead.

Tools like Free Download Manager (fave.co/3uf1ZZ4) offer an option to automatically scan downloaded files. You can find the function in the program's Settings menu under Antivirus.

Tip 8: *"Be cautious about sharing personal data and only share it via encrypted connections (https)."*

Social engineering is a method hackers have used for many years. The criminals obtain as much information as possible about a person and then try to get account data, passwords, or a signature from your victim via a fake email, SMS, or even by phone.

To prevent this, you should disclose as little information about yourself as possible when contacted. This applies especially to social media. Do not publish your private address or telephone number in generally accessible services. Do not talk about your partner, children, or other

Never disclose personal details, such as your private address or phone number.

relatives. Do not give bank details if possible. And keep your vacation plans to yourself.

Tip 9: *"When surfing, always make sure you have an encrypted connection (https). You can recognise it by a lock symbol or similar marking in the address bar of the browser."*

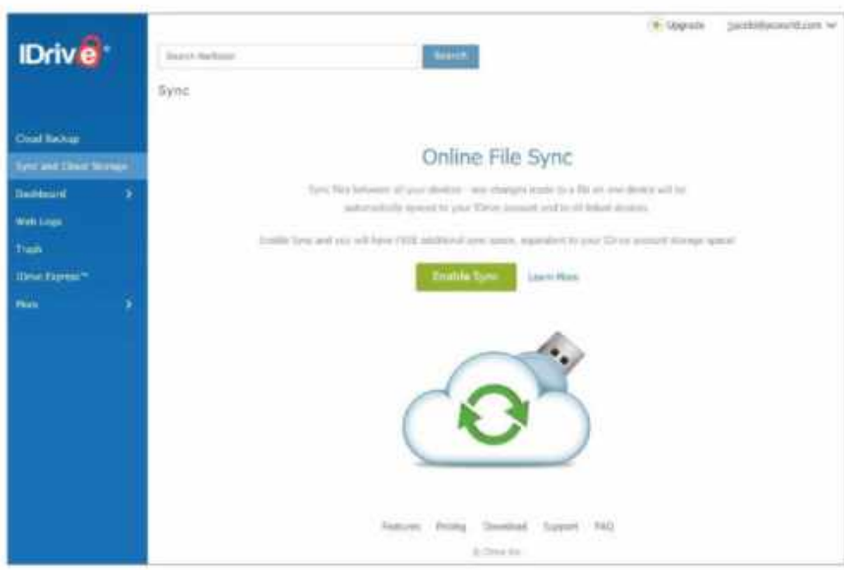
If you call up a website via an http connection, the data entered is transmitted unencrypted and in plain text, so that an intermediary hacker can read it if they're on your network or they've breached the site you're using. If, for example, an online shop appears on an http page, it is almost certainly dubious.

Chrome and Edge display http pages but mark them in the address bar with a preceding "Not secure." Firefox contains a preset security mode that automatically switches to the https counterpart without prompting when an http page is called up. If no https version is available, the browser displays the warning "Secure website not available." You will find the corresponding option in Settings under Privacy and Security, in the section "HTTPS-only mode."

Tip 10: *"Make regular backups on external storage media."*

One of the biggest dangers for private users and companies is ransomware viruses. Hackers use them to encrypt your hard drive and demand a ransom for decryption. You can protect yourself with regular backups of your data on an external storage drive. (Here are the best external drives we've tested: fave.co/3n5NlMC.) This must not be permanently connected to your computer, however, but should only be connected for the duration of the backup. Otherwise, if your computer gets infected by ransomware, your external drive might get infected as well.

You can simply drag copies of your most important files over to the external drive if you want to keep things simple, but if you want a more full-featured option and the ability to take restorable system images of your Windows installation, check out our roundup of the best Windows backup software (fave.co/3nlNb3Z) and best online backup services (fave.co/3FWaMk6).



It's a good idea to use an external storage service, such as iDrive.

Smokey Bear is within us all.

For wildfire prevention tips, visit
SmokeyBear.com

ad COUNCIL

IMAGE: YURI A / SHUTTERSTOCK

ERADICATE YOUR WINDOWS PC'S MOST ANNOYING HEADACHES WITH THESE TOOLS

EVEN AFTER ALMOST 40 YEARS AND COUNTLESS VERSIONS, WINDOWS STILL HAS NUMEROUS FUNCTIONAL DEFICITS. BUT THESE ARE EASY TO FIX.

BY CHRISTOPH HOFFMANN

If you ask Windows 11 users what bothers them most about Microsoft's current operating system, the answers are usually similar. Only the order differs slightly.

The inflexible taskbar: In Windows 11, the Start menu and icons in the taskbar are moved to the center by default and the customization options for the taskbar are limited.

Annoying updates: Windows 11 requires a restart too often for updates. Microsoft has also removed the option of manually pausing or delaying updates.

Missing functions: In Windows 11, Microsoft has removed some Windows 10 features—for example, Live Tiles, Timeline feature, Skype, and so on.

Unwanted adverts: Windows 11 still—and even increasingly—displays ads in various places: for instance, in the Start menu, on the lock screen, or in Explorer.

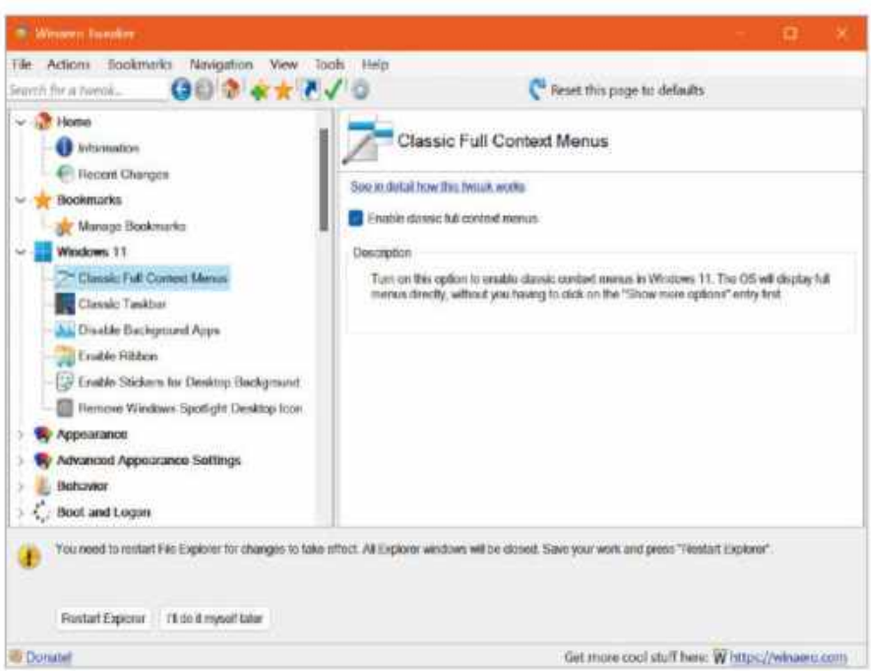
Annoying notifications: Windows 11's notification function is sometimes handy, but often it's rather annoying when it comes to tips and pop-ups.

You can quickly get rid of all the points of criticism and annoyances listed with our instructions and tools.

CUSTOMIZE THE WINDOWS DESIGN AND THE TASKBAR

With Windows 11, Microsoft has fundamentally changed the taskbar of the previous system, but not every user likes this complete redesign. The Start menu is now in the center instead of the bottom left as before. It also looks completely different. There are also new icons, a new color and font design, modern backgrounds, rounded window corners, and a slight transparency effect that is reminiscent of Windows Vista's Aero Glass. Microsoft has completely banished the previous live tiles from Windows 8.

While it was easy to customize the design of the taskbar and the range of functions in



Some tweakers do not work at all or only to a limited extent under Windows 11. This is due to far-reaching changes made by Microsoft that prevent the simple patching of settings via a registry hack.

previous versions of Windows using the appropriate tools, Microsoft has built a few hurdles into the new system, making it almost impossible to change and customize the taskbar and the Start menu.

Start All Back is one of the few programs that allows you to make changes to the Windows 11 (22H2) taskbar settings.

For example, the developer of Taskbar11 (fave.co/3SGfZ8C) writes: "Due to the removal of registry tweaks and related effects in Windows 11, the development of Taskbar11 is currently halted as features such as setting the taskbar to the top via the registry no longer work in the latest Windows 11 versions."

Other tools such as 7+ Taskbar Tweaker (fave.co/49sBjEi) are not compatible with Windows 11, so the developers have not even tried. The Explorer Patcher sometimes works, sometimes not. Basically, only the freeware Start All Back (fave.co/3uo2ikc), Winaero Tweaker (fave.co/3MHHk6g), and the two paid tools from Stardock remain: Window Blinds 11 (fave.co/3MITxrg) for a good $20 and Start 11 (fave.co/3SG151T) for $6.

Winaero Tweaker (fave.co/3MHHk6g) is ideal for simple changes—but only on condition that the computer is still running Windows 11 version 21H2 and not 22H2: In this case, the Enable Classic Taskbar option can be switched on in the freeware tool under Windows 11 > Classic Taskbar. At least the old (complete) context menu can also be activated in 22H2.

The Start All Back (fave.co/3uo2ikc) tool brings back the classic Windows Start menu and expands it with additional functions. The appearance of the taskbar, the context menus, and the notification area can also be customized.

By the way: With the Insider versions and Windows 12, Microsoft is at least partially rowing back and is apparently planning a completely new design: The taskbar appears to float on the desktop. It may even be possible to move the Windows 12 taskbar anywhere on the desktop. With the Rounded TB tool (fave.co/47fmSII), you can customize the shape and appearance of the Windows taskbar without modifying system files or making permanent system changes.

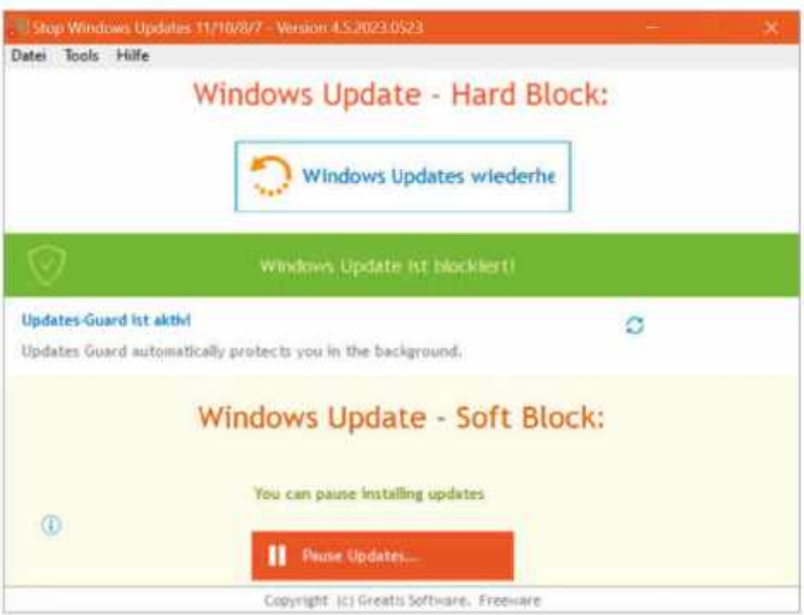
SCHEDULE WINDOWS UPDATES AND UPDATE PROGRAMS

With Windows 11, Microsoft has reorganized the Windows Update function. It has been improved so that even before you click on Optional updates you can see whether and, if so, how many updates are available there. With Windows 10, the optional updates were under the radar for many users, which sometimes meant that essential functions were not available at all.

The new option "Get the latest updates as soon as they are available" goes one step further. This can be found in the Windows settings under Windows Update. This solves the problem of Microsoft providing non-security-relevant updates, patches, and extensions via different service technologies and Windows devices receiving new functions at different times.

But not every Windows user wants this: The Stop Updates 10 (fave.co/479FDa3) tool can prevent or temporarily pause automatic Windows updates. This does not manipulate any system files or registry entries, but only blocks the execution of the update processes. You can cancel this at any time or activate it for a certain period of time.

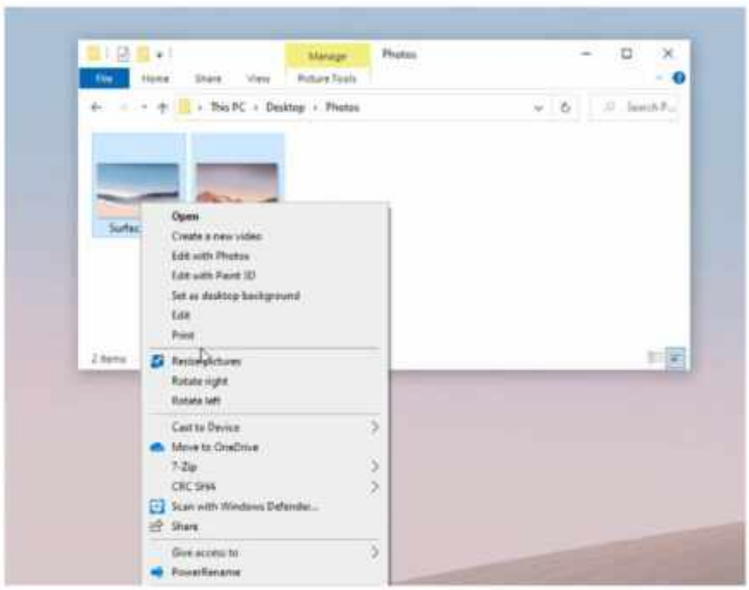
However, it's not just Windows itself and installed apps from the Microsoft Store that should be kept up to date. For non-Microsoft applications, there are tools that compare the programs installed on your computer with extensive databases and point out outdated versions.



Stop Updates 10: Use this simple and straightforward application to prevent Windows 10 from being forcibly updated without your consent.

The update checker, Sumo (fave.co/3SE3fiu), checks the software installed on the Windows PC. If an update is available, Sumo indicates this in the list with Update available. After you click on "Get update," a website of the Sumo manufacturer opens. A direct download is not possible with the free version, but searching via Google or the Majorgeeks (fave.co/3sHjwbT) download portal will help. The paid Pro version (from $19.99) also enables direct downloads.

Something similar also exists for drivers: Driver Max (fave.co/3QFOOrC) supports automatic installations, scheduled scans, and complete backups of device drivers. It can be set to check for driver updates at any time of the day, week, or month and download them for you.



PowerToys Image Resizer running on Windows 10.

UPGRADE MISSING FUNCTIONS WITH FREE SOFTWARE

The current Windows 11 also has various functional deficits, although Microsoft is constantly adding new functions. For example, the photo display recently received a major update, and the packer integrated in Windows will soon also support additional archive types such as RAR.

Nevertheless, some gaps remain. Some tried-and-tested free tool recommendations include Double Commander (fave.co/46gxHIU), Lockhunter (fave.co/4514BGD), Notepad ++ (fave.co/40ECGM1), Peazip (fave.co/46iV0f0), Teracopy (fave.co/49yGHWA), and Tweakpower (fave.co/3SGgAHo).

A first-class collection of useful tools comes from Microsoft itself: The PowerToys (fave.co/3Ut6RSH) consist of practical helpers that are available via the context menu of files and folders, for example. With just a few clicks, you can change the image size of photos, rename files, adjust the hotkey assignment, and use screen rulers and color pickers. The PowerToys collection now includes more than 20 tools.

Installing new programs can be annoying: Instead of loading the basic software configuration by hand, you should use the online service Ninite (fave.co/32BzNIO). On the website, tick the boxes in front of the programs you want to install. Click on Get Your Ninite and download the installer. This will set up all applications and tools without any further queries. For any existing updates, restart the installer after a while.

Did you know that Windows 11 has a package manager modelled on Linux? The winget command can be used to freshly install and update programs. However, it is quite tedious to use on the command line.

Winget UI (fave.co/3SI8jCy) promises more convenience—an interface for Winget.

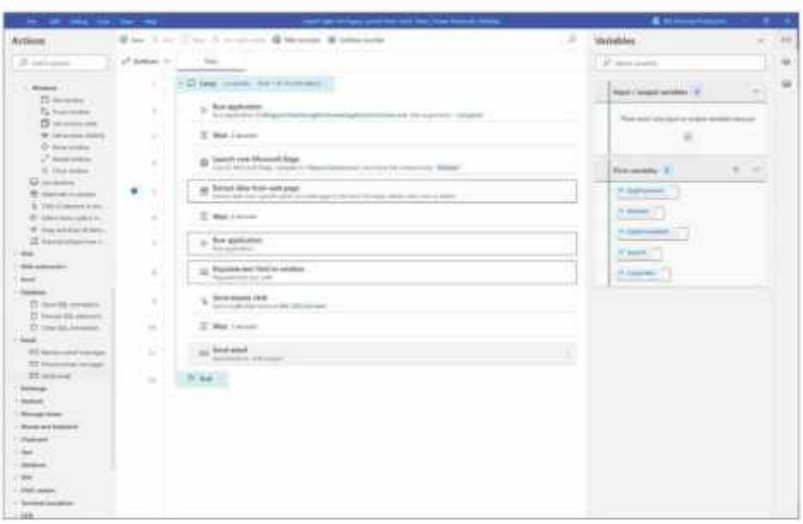
After the first start, you select and activate the download channels, then install existing updates, or select your favorites for installation from the list of programs. On our test system, a total of 14,610 packages are available for installation with Winget UI—although there are some duplicates.

Here's a tip: Windows 11 Debloater (fave.co/49LJRXc) and Bloaty Nosy (fave.co/3ulpKyx) make it easy to remove preinstalled apps, even if Microsoft doesn't offer any other function for this.

AUTOMATE TASKS

You can largely automate frequently recurring tasks. This saves time and is easy on your nerves. With Power Automate (fave.co/49xZv8m) from Microsoft, which is available free of charge to Windows 10 and 11 users, you can simply click together automation steps or record mouse and keyboard actions. Microsoft provides a good introduction to the possibilities of Power Automate. Some examples of flows can be adopted and customized directly. Another practical helper is Autohotkey (fave.co/3G7r4FA), a free open-source scripting language with which you can easily program your own macros.

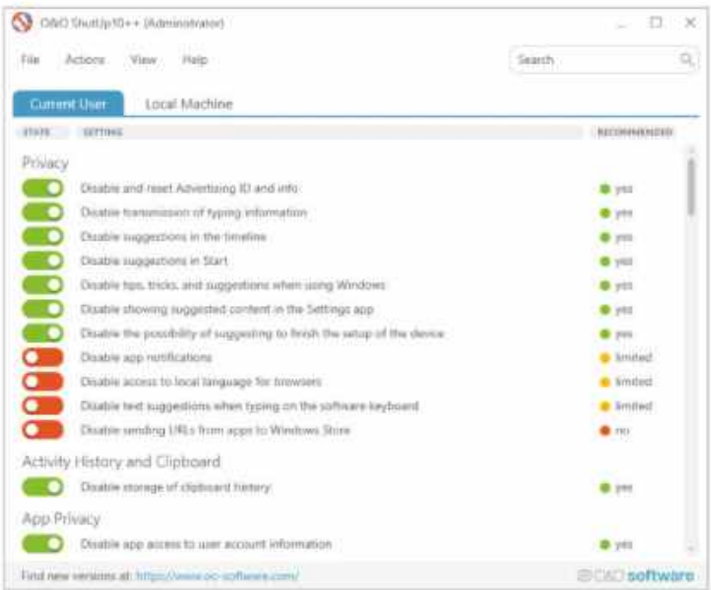
You can organize the shutdown and (re) start of Windows with the Autoshutdown Manager (fave.co/46gRG45). This shuts down the PC, for example, if no mouse or keyboard input is recognized for a set period of time. With PhraseExpress (fave.co/3u8wGz0), you can manage any text modules and insert them into emails or documents, for example, at the click of a mouse or using a hotkey on the computer. This also makes you more productive in everyday life.



With Power Automate, you can automate recurring tasks on your PC with just a few clicks, without needing any programming knowledge.

SWITCH OFF UNWANTED ADVERTISING AND NOTIFICATIONS

Whether in the Start menu or lock screen, Windows 10 and 11 repeatedly display advertising messages for new apps and games. Windows 11 in particular can be really intrusive, and even the Start menu and lock screen are not spared. Although there is an option in the Settings app under



O&O Shutup 10++ lets you disable ads in Windows, among other customizations.

Personalization > Start to show recommendations for tips, shortcuts, new apps and more, the system is not completely free of advertising.

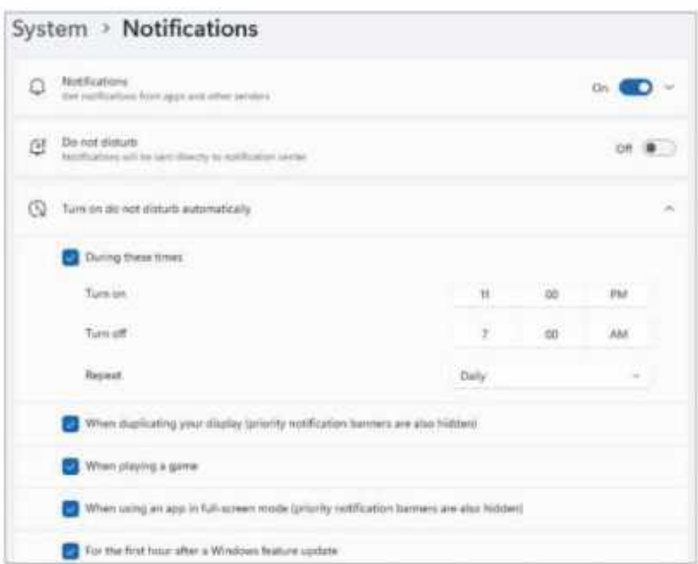
The tools Tweakpower (fave.co/3SGgAHo) and O&O Shutup 10++ (fave.co/3swWI48) offer more options. Here you can prevent Windows from displaying adverts and notifications. In the Insider versions of Windows, Microsoft itself is experimenting with a corresponding setting: It is called "Occasionally show account-related notifications in the Start menu."

The Windows notification assistant is not a bad thing in itself. However, with many active applications, the number of notifications is inflationary: Incoming emails and chat messages, completed file and program actions, and successful data synchronization with cloud services—over time, this becomes too much and then annoying.

To change the settings, right-click on the notification icon in the taskbar and then click on the Notification Assistant entry. You can choose from three options in the following dialogue:

- Disabled
- Only with priority
- Alerts only

By default, Windows displays all notifications from apps or contacts. Further options can be found in the Settings under System > Notifications. The "Do not disturb" option mutes all notifications from the operating system. The setting can also be time-controlled or linked to certain rules.



In the notification settings, you can define trouble-free times and exceptions. This at least gives you some peace and quiet at work.

Good solution and important: The blocked notifications are not lost. They can be viewed at any time in the Info Center.

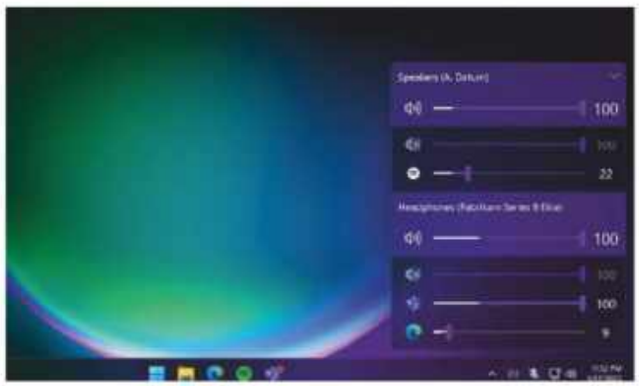
THESE TOOLS MAKE IT EASY TO CHANGE SETTINGS

The Windows 10 and 11 Settings app (shortcut Win+I) is the central hub for configuring the system and switching functions on or off. Additional tools not only make this more convenient, but also give you access to hidden settings.

Defender UI (fave.co/3LsCXeT): Microsoft Defender is Windows' on-board tool against viruses and other attacks. You can find the Defender under Windows Security in the Start menu. The main thing that could be improved about Defender is its user interface. The DefenderUI tool clearly summarizes the scattered security options of the operating system and offers four selectable security profiles.

O&O Shutup 10++ (fave.co/47PKtt9): Privacy protection settings are scattered and not always easy to find. Alternatively, the O&O Shutup 10++ tool displays all Windows privacy and security settings in a list. A click on the respective setting provides details. A red switch means that the Windows default settings apply. If the switch is green, the function has been deactivated.

Eartrumpet (fave.co/3FZeE5a): This tool extends the volume control of Windows 11. After installation, you can adjust the volume of individual applications and devices without having to open the system settings. Eartrumpet also allows you to quickly switch between headphones, speakers, or Bluetooth devices.



Eartrumpet lets you adjust the volume without opening system settings.

Autoruns (fave.co/3ub84FX): Unnecessary programs can be removed from the autostart so that Windows starts faster and the active processes do not consume system resources. This can be done quite conveniently with the Microsoft tool Autoruns. You can switch the autostart of programs and services on and off at the click of a mouse.

Regcool (fave.co/3suMWtV): The Regcool tool is much better than the Windows built-in registry editor. It allows you to search the registry database and use the functions for comparing, copying, exporting, importing, backing up, and restoring content. You can also change or delete several keys and values at the same time.

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AARP can help with information and useful tips on how you can maintain a healthy life balance, care for your own physical and mental well-being, and manage the challenges of caring for a loved one.

Get help from others. Ask family and friends for assistance. Seek advice from other people caring for their loved ones.

Care for yourself. Don't forget about your own needs. It's just as important to make a plan to take care of yourself as it is to create a caregiving plan for your loved one.

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You're there for them. We're here for you.

Find free Care Guides to support you and your loved one at **AARP.org**/caregiving

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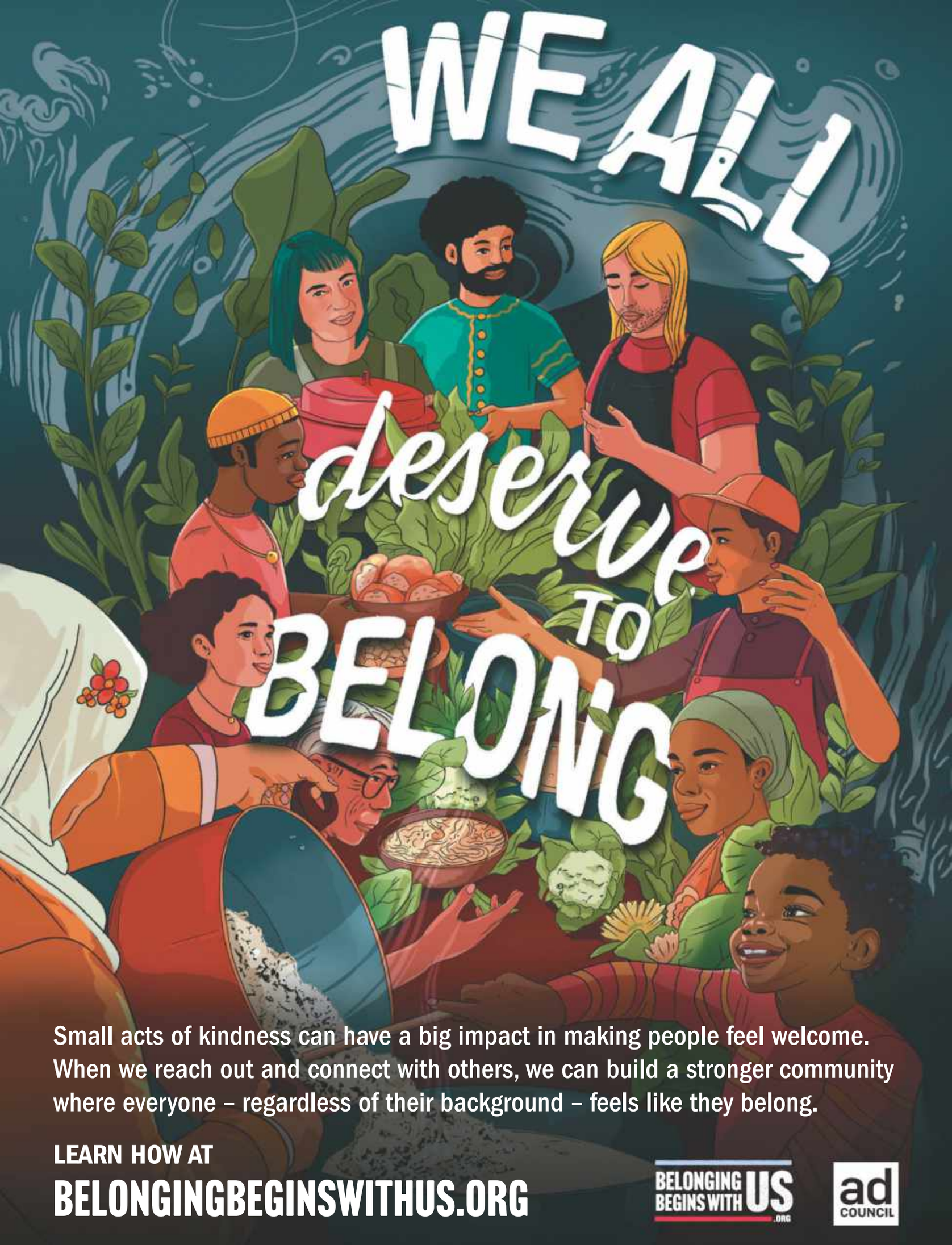

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21 Chrome tips to make browsing smoother and faster

Do you think Google Chrome consumes too much battery and works too slowly? Here are tips to make your browser faster and better. **BY MARTIN APPEL**

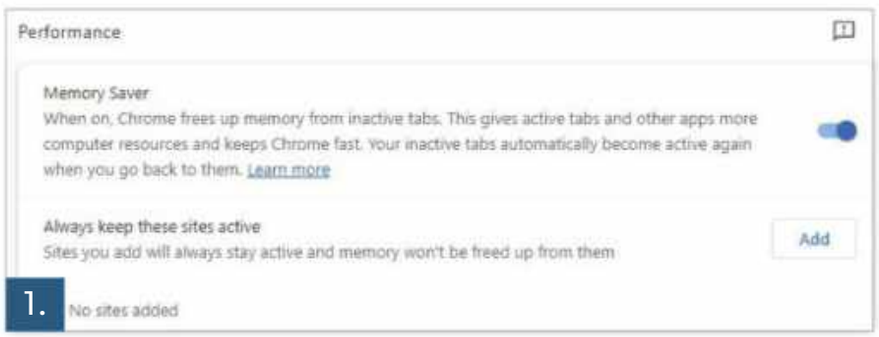
Google Chrome is not only the world's most popular browser, it is also one of the most powerful. With each new version comes a number of new features that are easy to miss. We've put together 12 smart tips to make it faster and better.

1. PAUSE THE SITES

Having many tabs open can slow down your computer and reduce battery life. Therefore, you can "pause" tabs that you're not looking at.

HOW? Press the three dots in the top right corner, select Settings > Performance,

IMAGE: PREMIO STOCK/SHUTTERSTOCK



and switch on or off the Memory Saver mode. You go to "Always keep these sites active" to select sites that should never be paused. You can do this by clicking on Add and typing the web address.

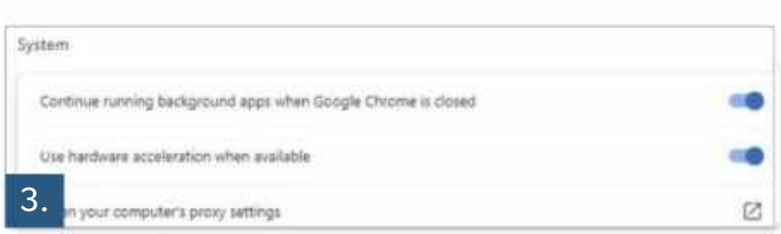
2. SAVE THE BATTERY

To save your battery, you can use Chrome's power saving mode, which limits background activities, visual effects and more.

HOW? Tap the three dots in the top right, select Settings > Performance, and turn the feature on or off with the slider at the top. You can also choose to activate it only when the computer is unplugged or when the battery gets low.

3. SWITCH OFF BACKGROUND APPS

Some Chrome services may always be active, even when you have turned off the browser.



HOW? Tap the three dots in the top right corner, select Settings > System and enable or disable "Continue running background apps when Google Chrome is closed." In this window, the advanced user can also control various system settings.

4. SAVE YOUR DOWNLOADS

If you have trouble finding the files you save in Chrome, you can change the default settings.

HOW? Click on the three dots in the top right corner and choose Settings > Downloads. Under Location, select the default folder for files you have downloaded (for example, Downloads or your computer's desktop). You can decide whether they should always be there or whether you prefer to ask where to save the files before downloading. You can also switch on or off the option to show downloads when they are done.

5. VIEW HISTORY

If you want to find a webpage you've visited before, you can use Chrome's history. If you are logged in to multiple browsers, the history is also displayed from other devices.

HOW? Go to the three dots in the top right corner and select History, and you will see the last visited sites. You can also click on History (again) to see a detailed

5.

list—and you can switch between Chrome history and Tabs from other devices. To delete a page, tap the three dots on the right, and select "Delete history." If you can't find it, use the search bar at the top.

6. RESET SETTINGS

If you want, you can reset all settings to their default state.

HOW? Press the three dots at the top right and select Settings > Reset the settings. Then choose "Reset settings to default settings."

7. UPDATE CHROME

To get all the new features, Chrome must be updated. The update happens automatically, but can also be started manually.

HOW? Press the three dots in the top right corner and select Settings > About Chrome to see which version you are running and to start an update.

14 QUICK SHORTCUTS

A smart way to become more efficient in an application is to skip the mouse clicks and use keyboard shortcuts instead. Here are 14 keyboard shortcuts in Google Chrome that you don't want to miss out on.

Ctrl+T: Open a new tab

Ctrl+N: Open a new window

Ctrl+Shift+N: Open an incognito window to browse (more) anonymously

Ctrl+W: Close an open tab

Ctrl+Shift+T: Open the last closed tab or window

Ctrl+Shift+A: Search all open tabs

Ctrl+Page Up: Jump up to the left in the tab list

Ctrl+Page Down : Move up to the left in the tab list

F5 (refresh page): Use Shift+F5 for a more basic refresh

Alt+D (or F6): Jump to the address bar and select all the text in the address bar so you can enter a new web address

Ctrl+K: Search on Google by turning the address bar into a search box

Ctrl+plus or minus (+ or –): Zoom the page by making it bigger or smaller

Ctrl+0: Allow the page to return to 100 percent, the original size

Ctrl+D: Bookmark the page quickly

Footnote: *In our examples we are using the latest Windows version of Google Chrome (116). If you have any other version, it may look different. If you use Microsoft Edge or any other browser, chances are that the same functions are also available here, but with a slightly different look.*

Your email account was hacked. What now?

Hackers hijack mail accounts to send spam under someone else's name. But the intruders leave traces, and there are also ways to get rid of them again. **BY ROLAND FREIST**

The first sign that something's wrong is almost always the same. Friends and business contacts complain that they're receiving mail with advertisements from you. Dozens of notifications from mailer daemons accumulate in your inbox, claiming that your mail cannot be delivered. Either the addresses of the recipients were misspelled or they did not exist. Or perhaps you received a message from your mail provider saying that someone has changed your personal data.

Now your alarm bells should be ringing, as it's possible that your **mail account has been hacked**. A Trojan virus that spied on the access data to your account and sent it to a criminal hacker via the internet, or a hardware keylogger on the USB port that records your

IMAGE: PATHDOC/SHUTTERSTOCK

keystrokes and mouse movements—one of these may be responsible.

RUN A VIRUS SCAN

The first step should always be to scan the computer for viruses. To do this, run a deep scan or a complete scan of the hard disk with your antivirus software (fave.co/3CnDHuk).

In Windows Defender, you can find the corresponding command by double-clicking on the Defender icon in the taskbar corner under "Virus and threat protection > Scan options." In the next window, select "Full scan" and then "Scan now."

In addition, you should check the USB ports on your PC to see if the plugged in device is yours or not. Caution: Keyloggers are very small and inconspicuous and often look like plug-ins.

STOLEN PASSWORDS FROM THE INTERNET

If the virus scanner finds nothing and no **keylogger** is connected, your mail password has probably been hacked. In most cases, hackers resort to passwords that appear under your mail address in the darknet. There are huge collections of addresses and passwords there that have been captured by criminals as a result of security leaks at companies or online services.

Since many people use the same password to log in to online shops, streaming services, company websites, and even mail accounts, hackers also try out the combinations of mail address and password published on the darknet with a whole range of popular mail services.

If you have been using the same password over and over again, you should change it as soon as possible, for all services and shops where you have used it. Define a different password each time to make such attacks impossible. Write down the passwords on a piece of paper or save them in the database of a great password manager (fave.co/3IRkfRz).

Another possibility is that you've identified a weak and easy-to-guess password for your mail account, which the attackers can easily crack. Therefore, make sure that you only use strong passwords.

HAVE YOUR ACCESS DATA BEEN LEAKED?

To check whether your password has been leaked published on the darknet, go to fave.co/3EMeE7P and enter your e-mail address. The site maintains a database with millions of entries from data thefts of the past years. If your access data appear there, it will show you the companies from which the hackers took the data. You should then change the passwords for these companies immediately. Alternatively, you can use fee-based tools such as Bitdefender Digital Identity Protection (fave.co/47zGfFR) or F-Secure ID Protection (fave.co/46fPQ3B), which regularly and

automatically perform scans for your access data on the internet and inform you about new findings.

In the "Notify me" tab, you can also leave your email address at fave.co/3EMeE7P. If the address appears in a list of stolen access data in the future, you will automatically receive a mail notification. In the Passwords tab, you enter passwords for verification. The website shows you whether this password appears in the relevant lists. If it does, it is insecure, as hackers keep lists of such passwords and try them out on login masks automatically and in frantic succession.

SEND A WARNING TO FRIENDS AND COLLEAGUES

When criminals crack a mail account, they usually do so in order to be able to send spam via a legitimate address. This is because all major mail providers today keep blacklists of mail addresses of known spammers in order to automatically sort out their mails.

Spammers therefore always need new sender addresses. Addresses that have existed for a long time have the advantage, as recipients trust the sender and read the message instead of deleting it immediately.

As soon as you discover an intrusion into your mail account, you should send a message to your friends, colleagues, and business partners, warning them of the possible spam.

You should also check your account settings, especially for online accounts. It's important to see if the list of people who have access to your account has changed. You should also check for automatic mail forwarding, out of office notifications, blocked mail addresses, and newly set up remote access and filters for incoming messages.

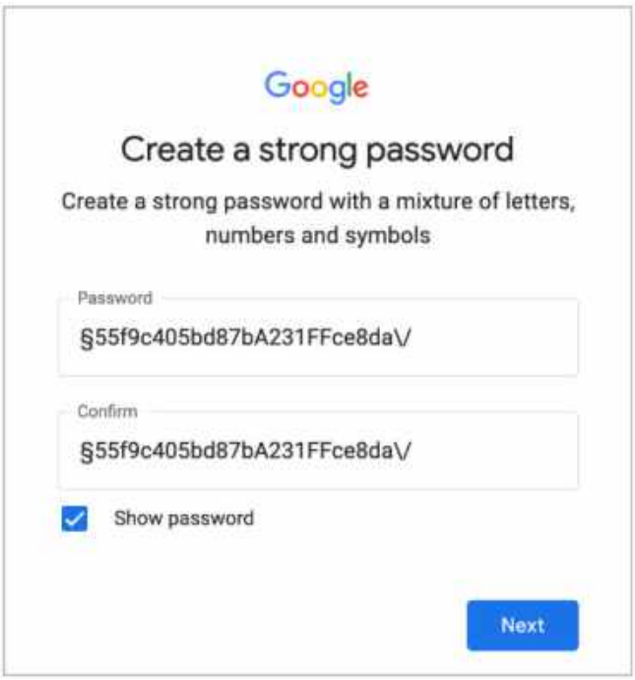
ACCESS DENIED: WHAT TO DO?

To prevent the owner of a mail account from taking control of their account again after a successful hack, criminals sometimes change the password so that it is no longer possible to access the account settings. However, the major providers have taken precautions and show ways and means for a reset.

Google Gmail: If you can no longer access your messages, you will not be able to use the other services of the search engine giant. To log in again, call up the account recovery via this address (fave.co/3u8zNaa). There you can identify yourself using your e-mail address or the telephone number you have stored.

On the following page, Google offers you several options for confirming your identity, ranging from a message to your smartphone or tablet to an alternative mail address or a confirmation in Google Authenticator or SMS. After clicking on "Try with another login option," you also have the option of entering an older password.

If Google detects that you want to sign in



A secure password should include uppercase and lowercase letters, numbers, and special characters.

from a new device or a different location, you may have to answer some questions. If you have requested a code, enter it now. You can then change your password.

Microsoft Outlook: Microsoft's Outlook.com mail service is tied to your user account. If your password no longer works, you need to recover the account. To do this, you need a working mail address to which the company can send further information. This can be a secondary address of yours, but you can also enter the address of another person. You can find the account recovery form at fave.co/3QVGLIH.

Microsoft will send you a code, which you enter on the website. You will then be asked to enter your personal data such as first and last name, date of birth, postcode of place of residence, and to answer a security question. The next step is to ask for older passwords and whether you use other Microsoft services or have subscriptions for Windows or Microsoft 365, for example.

In this case, the assistant wants to know your credit card details. As soon as you have entered all the information, you will receive a message that says your details are now being checked and you will receive an answer within 24 hours. Microsoft also registers your location and the device from which the account recovery request comes. If you want to log in to a new location using a different device, this process becomes a bit more complicated.

Two-factor authentication: For security reasons, you should set up two-factor authentication on your account. A smartphone app such as Google's Authenticator or Microsoft's Authenticator is recommended as a second factor in addition to password entry.

WHAT A SECURE PASSWORD SHOULD LOOK LIKE

- It consists of at least 16 characters.
- It contains uppercase and lowercase letters, numbers, and special characters.
- It is not in the dictionary.

The password generators of password managers are helpful for creating a secure combination of characters.

How to find out what Google knows about you

Google Dashboard makes it easy to see the information the company stores about you.

BY MARTIN APPEL

Seeing how much information Google stores is both interesting and scary. YouTube, Android, Chrome, Gmail, Search, and Maps are just a few examples of all the Google services we use in our digital lives, day in and day out.

As users, it's easy to lose control of the information we've given up that Google has access to. Fortunately, there's an easy way to find out what Google knows about you—using the Google Dashboard service. Here you can see exactly what you've done in different Google services and what information is stored. Here's how to do it:

1. Go to fave.co/49x4DJP.

2. Sign in with the Google account you are interested in.

3. Under the heading **Recently used Google services**, you'll see what you've done recently, but you can also scroll down to **Other Google services**.

4. As you can see, the information is sorted by service or app. Depending on which service or app it is, there are various options, such as **Delete backed up data**, **Settings**, and **Your data from XX**.

5. At the top you will see the options **Delete a service** and **Download your data**. If you don't want to keep one or more Google services, you can save your personal information and cancel the service.

IMAGE: LETS DESIGN STUDIO/SHUTTERSTOCK

How to turn on Windows' hidden PC performance overlay

Keep an eye on your system's vitals with Windows 11's hidden performance overlay.

BY ROLAND FREIST

Gamers often want to keep an eye on their computer's resources. But it's also practical when working with performance-hungry programs, such as graphics applications or video editing, to see immediately whether the working memory is sufficient and how the CPU is being used. Windows offers a corresponding display for this purpose, but you'll need to know where to look.

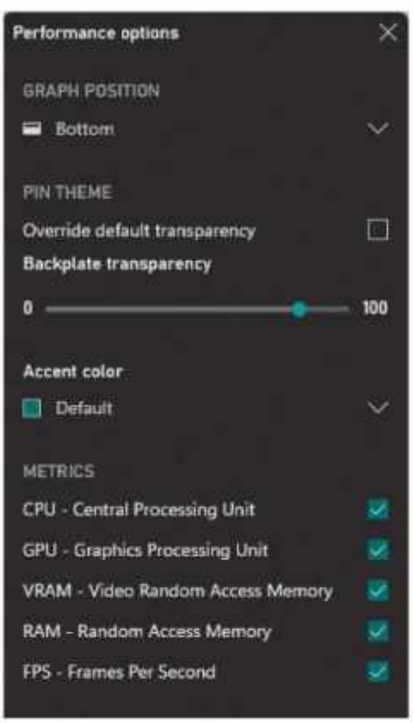
First, open Settings in the Windows Start menu and click on Gaming in the left column. On the right side, go to Xbox Game Bar and

IMAGE: MICROSOFT

Gamers often want to keep an eye on their computer's performance.

make sure that the switch for "Open Xbox Game Bar with this button on the controller" is set to On. You can then close the Setting app.

Press the key combination Win-G to open the Game Bar. Click on the Performance icon to open the window with the same name. Click on the icon with the sliders in the title bar, called "Performance options." Make sure all five options—CPU, GPU, VRAM, RAM, and FPS—are ticked. Open the drop-down menu GRAPH POSITION at the top and then set it to Bottom. Hover your cursor over the Performance window and click on the downward-pointing arrow on the bottom right. This is labeled Collapse Chart. Now move the performance bar to any position. Finally, click on the pin in the title bar of the window to keep it permanently in the foreground.



If desired, the Xbox Game Bar will display constantly updated information on the utilization of CPU, GPU, and memory.

RISK OF LIGHTNING STRIKE:
1 IN 500,000

LIFE DOESN'T ALWAYS GIVE YOU TIME TO CHANGE THE OUTCOME.

PREDIABETES DOES.

RISK OF PREDIABETES:
1 IN 3 ADULTS

TAKE THE RISK TEST TODAY AT DoIHavePrediabetes.org

ad COUNCIL

AMA AMERICAN MEDICAL ASSOCIATION

CDC CENTERS FOR DISEASE CONTROL AND PREVENTION

Tech Spotlight

A video showcase of the latest trends

Watch the video at youtu.be/rTG1tziWF-A

VRAM Explained: How It Works & How Much You Need For Gaming

There's a lot to know about the memory inside your graphics card. But in this short breakdown, you'll learn everything you need.