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Some lucky people have seen Apple's AR headset – and they don't like it

As Apple prepares to launch its next big thing, reports say there is rare dissension and division among the ranks. **David Price** reports

Last month, according to leaker Mark Gurman and others, Apple held a glitzy showcase event where its 100 most influential employees got to see the latest progress of the mixed-reality headset project. This project is expected to culminate in a public launch later this year, likely at WWDC in June, which means the showcase event should have had an air of both finality and celebration, but it appears this was not entirely so.

Discussing the behind-closed-doors event in the latest edition of his Power On newsletter

(fave.co/3ZnVHjB), Gurman explained that Apple has run secret internal demos of the headset every year since 2018, but that this one was different: it was grander and more polished, essentially, taking place in the same Steve Jobs Theatre as far higher-profile public announcements. This is likely because the device and the event are close to completion after numerous delays – and because the pitch is a large part of what will make the headset successful.

For all the glitz and glamour, however, it is evident from Gurman's account and particularly from a more critical parallel report in the *New York Times* that all is not well in the Apple camp. "As the company prepares to introduce the headset in June," writes the *NYT*, citing the testimony of multiple current and former employees, "enthusiasm at Apple has given way to scepticism." The paper names the high $3,000 price, and the debatable usefulness and marketability of the product as key concerns, and reports that some members of staff have been so doubtful of the

project's viability that they have defected to different parts of the business, while others have been fired for "lack of progress with some aspects of the headset, including its use of Apple's Siri voice assistant".

Gurman, more tactfully, describes Apple executives as being "clear-eyed about Apple's challenges pushing into this new market", and says they are "striking a realistic tone within the company. This isn't going to be a hit product right out of the gate."

Reports of scepticism and disagreement related to Apple's headset are not new. Earlier this month it was said that Apple designers lobbied to postpone the

The original Apple Watch wasn't a hit out of the gate, but its lavish solid-gold model got a lot of attention.

headset's launch until the technology became more advanced and that Tim Cook overruled these concerns and insisted on a launch this year. A glance at a calendar alone, indeed, would give clues to long-running problems: Apple has been talking up its interest in AR and VR since at least 2016, but has yet to launch any actual hardware for this market. It's relevant, perhaps, that even back in 2016 Cook was careful to point out that "there are some really hard technology challenges" and to warn that it would take some time for AR to become "acceptable", a cautious caveat for a potentially business-changing product category.

Gurman discusses the idea that the so-called Reality Pro mixed-reality headset could follow the same path as the Apple Watch, by which he means an intriguing but low-profit launch followed by improved and cheaper follow-up versions and a gradual evolution towards an eventual market niche. It took the Apple Watch several generations to find its purpose as a health and fitness device, something which wasn't clear when it arrived with a £10,000 gold option.

Gurman may be right about this, and it's always risky to underestimate Apple's powers of marketing. But such a feat would be far more impressive this time around because the headset will be so much more novel than a smartwatch and much more ostentatious and uncomfortable to wear. It's much harder to sell early adopters on the potential of an experimental new device if it costs $3,000, too, which means there will be fewer models in the wild to seed the curiosity of the next generation of customers.

If we're not convinced, we can usually count on Apple's hype engine to tell us why we're wrong. But if Apple's own employees can't see through the reality distortion field, it's a worrying sign for a company that is normally so good at putting out a consistent and enthusiastic message.
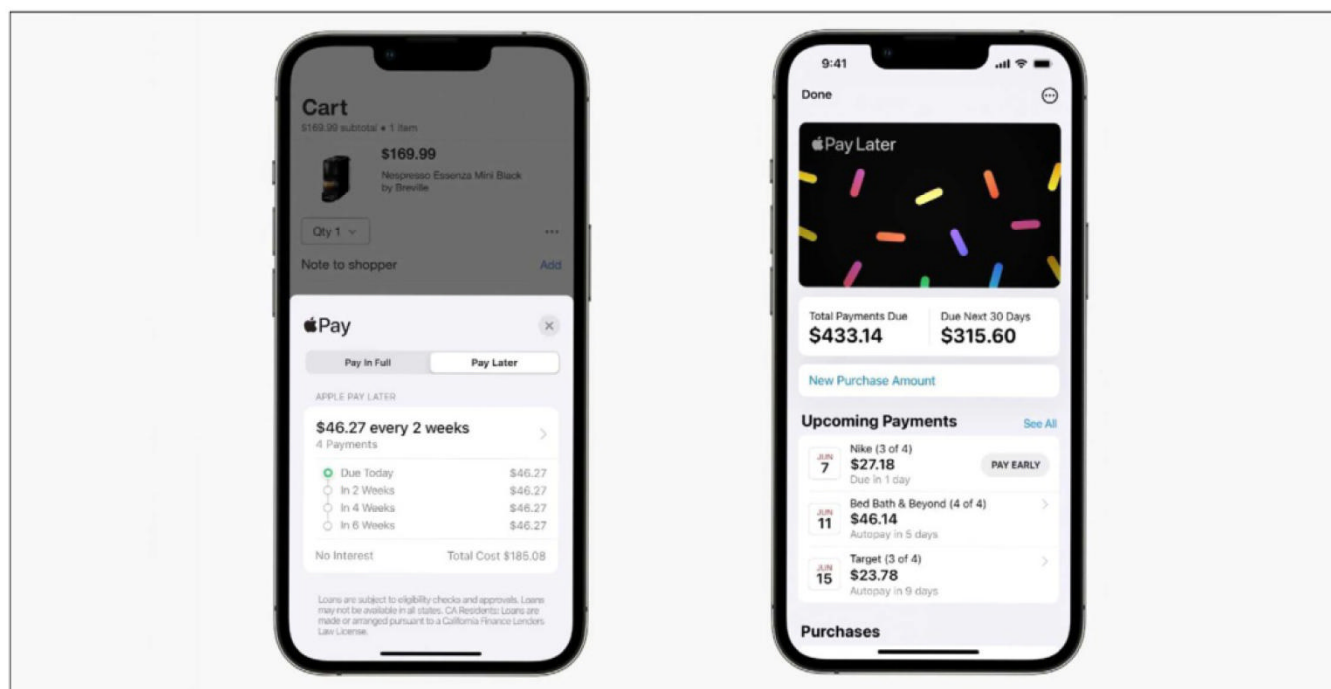
Apple Pay Later available, but only to 'randomly selected' users in the US

Apple has started inviting select US users to access a pre-release version of its financing service. **David Price** reports

Apple Pay Later, a buy now, pay later interest-free service announced at WWDC in June 2022, finally began rolling out today, but for the time being, will be open only to the lucky few. And we mean lucky in the literal sense, because Apple says the first people allowed to use the service have been selected at random.

In a press release, the company says that starting 28 March, it "will begin inviting select users to access a pre-release version of Apple Pay Later, with plans to offer it to all eligible users in the coming months". Select can mean a lot of things (and

implies some form of criteria), but in the small print, it clarifies that invitations will be sent to "randomly selected users." In fact, we suspect that both are true to some extent. It would make sense for Apple to randomly pick invitees from a pool of those who pre-qualify according to a variety of criteria, potentially including past financial activities and/or credit rating.

One of the qualifying criteria, at any rate, is that you must be 18 or older to use it (19 in Alabama). Another is that you must be a US citizen or resident since Apple is launching the service in its home territory only at first. (Though not in all 50 states: Hawaii, Nevada, New Mexico, North Carolina, Wisconsin and the US territories are all currently excluded.) We don't know when the service will spread to the remaining states or to other countries, if at all, nor indeed when it will graduate from 'pre-release' to full release. Apple only says it "plans to offer it to all eligible users in the coming months".

Beyond these trivial details, however, there's much about the service to intrigue. It's a simply structured loan service that splits the cost of purchases into four equal

payments: the first must be paid immediately and the remaining three at two-week intervals. That's the initial structure, anyway. Bloomberg reports (fave.co/3ZnT2Xs) that a longer-term Apple Pay Monthly plan is in the works as well.

The service is not limited to the purchase of Apple products, but there is a long list of forbidden items, including gambling, cryptocurrency, pornography, tobacco and gift cards. This includes a blanket ban on "Any goods or services deemed unacceptable by us."

As long as the payments are made on time, there are no interest or fees at the consumer end. If payments are missed, however, Apple will be handling the financing itself under a new Apple Financing LLC rather than working with partners such as Goldman Sachs, which handles the Apple Card.

Apple has published a support document (fave.co/3FWaQBW) explaining how to apply for and use Apple Pay Later, but unless Tim Cook sends you a golden ticket, you won't be able to try the service out for yourself until later this year. Which for reasons of financial prudence might not be a bad thing.
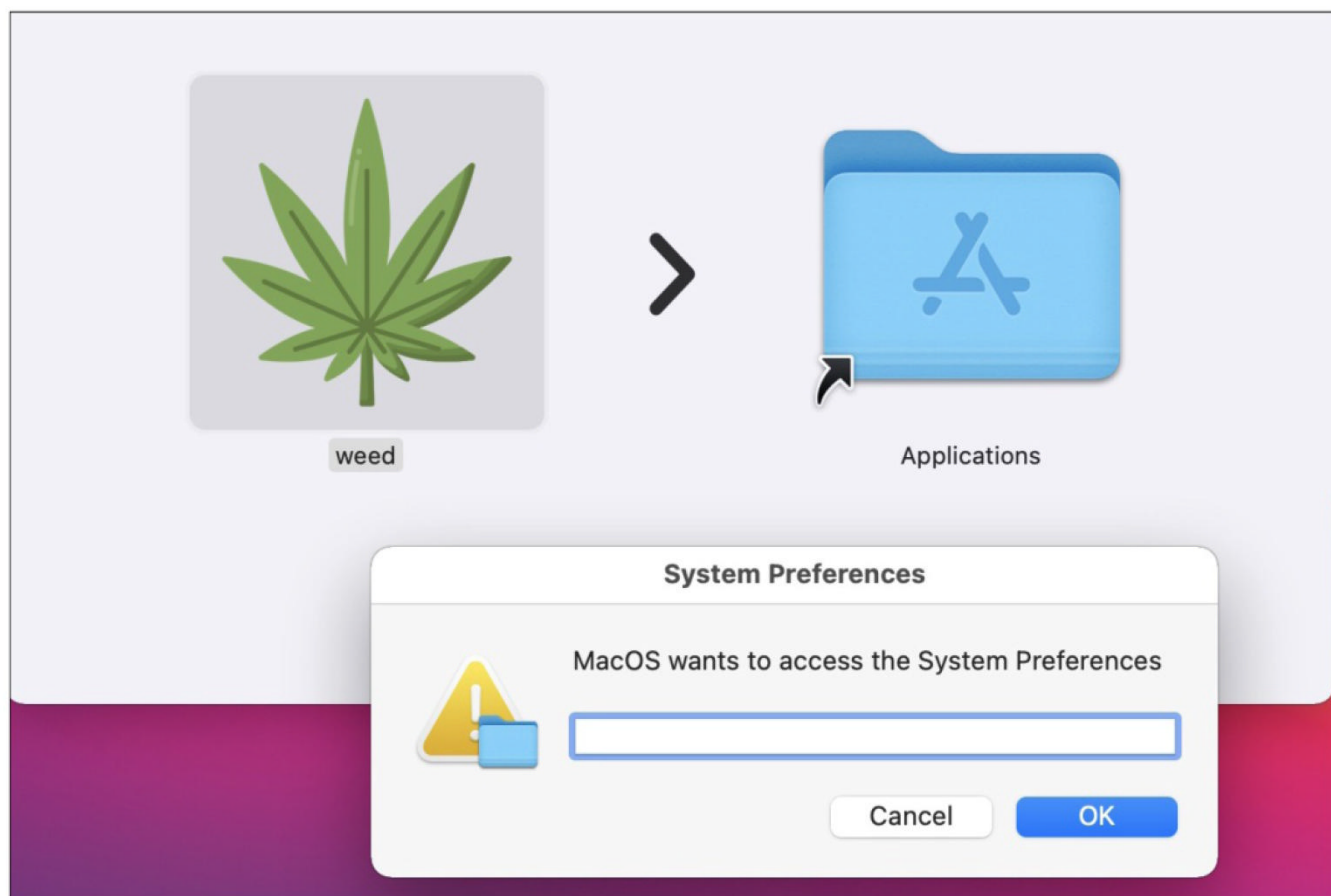
Scary 'MacStealer' malware goes after iCloud passwords and credit cards

Security community is abuzz about Telegram-based intruder. **Roman Loyola** reports

S ecurity researchers have published a report detailing the arrival of new malware that goes after sensitive data that's stored on your Mac, including passwords and credit card data. According to the security team at Uptycs (fave.co/3TUbEgg), the 'MacStealer' malware can attack Macs running macOS Catalina

or later, with either Intel or Apple M-series chips.

Uptycs found that MacStealer can get passwords, cookies, and credit card data from Firefox, Google Chrome, and Brave browsers. It can extract several different file types, including, .txt, .doc, .jpg and .zip, and it can extract the KeyChain database. According to information Uptycs gathered from the dark web, MacStealer's makers are working on the ability to harvest Safari passwords and cookies, as well as data in the Notes app.

"The bad actor uses a .DMG file to spread the malware. After a user executes the file, it opens a fake password prompt to gather passwords using the following command line," according to Uptycs' report. MacStealer appears to propagate through a 'weed.dmg' executable file. When the 'weed' app launches, a pop-up appears, stating that 'macOS wants to access the System Preferences' and a box below that is for the user to enter the account password.

After that, MacStealer goes to work, gathering the data, compressing it as a Zip file, sending it to the MacStealer maker, and then deleting the stolen data

to hide its tracks. The maker then hands the data off to whoever contracted MacStealer.

Uptycs found MacStealer through 'dark web hunting', where the maker posted about MacStealer's abilities and its availability to bad actors for $100 per build. It's unknown how the 'weed.dmg' is distributed by the bad actor, but the DMG file only needs to be launched for a Mac to be infected. Why the app described here is fairly easy to avoid, it's not hard to imagine a hacker using a more popular app for dissemination.

It's unclear if MacStealer has been logged in the CVE.report database (fave.co/3lT3t7G) that tracks vulnerabilities and exposures, and Apple has not commented on the malware. Apple recently released updates for macOS Big Sur, Monterey and Ventura, but based on the security notes, those updates do not appear to include patches for MacStealer.

Still, Apple releases security patches through operating system updates, so it's a good idea to keep your Mac up to date. When you need to download software, get it from trusted sources, such as the App Store (which makes security checks of its software).
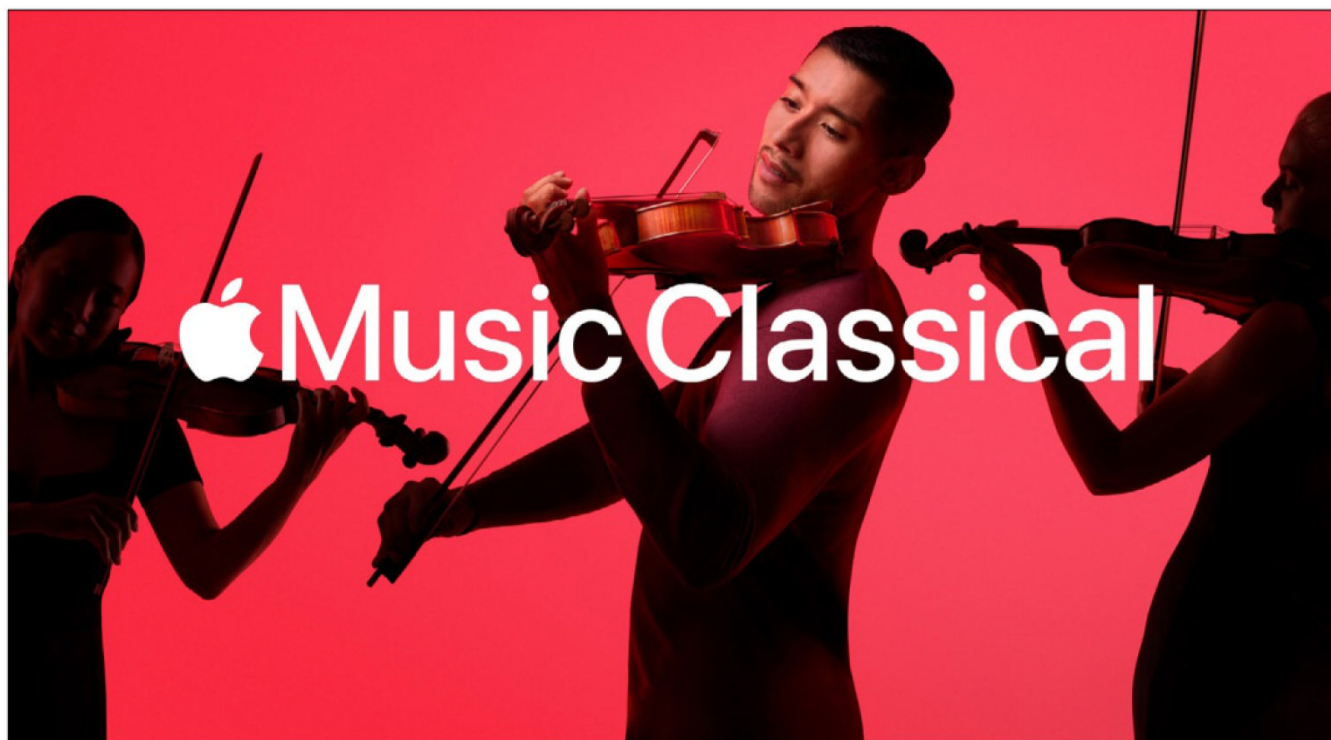
Apple Music Classical is now available, with a few curious caveats

The app for Apple Music subscribers has 'the world's largest classical music catalogue', but comes with restrictions. **Michael Simon** reports

After several weeks as a preorder, Apple Music Classical is now available as a free app for Apple Music subscribers. Users can download it in the App Store as a standalone app dedicated to 'the complex data structure of classical music'. The interface is similar to the main Apple Music app, with four bottom tabs for Listen Now, Browse, Library and Search tabs. The Browse section is divided into three main categories – Catalogue, Playlists and Instruments – which are further segmented into sections

for composers, soloists, time period, mood, and much more. Each individual instrument also gets its own section of the app, with the latest releases, popular artists and works, and a full description of its importance to the genre.

In a support document (fave.co/3ZueidY), Apple explains why classical music needs a separate app: "Classical music is different. It has longer and more detailed titles, multiple artists for each work, and hundreds of recordings of well-known pieces. The Apple Music Classical app is designed to support the complex data structure of classical music."

However, while the app is extremely fast and full of rich details, there are several Apple Music features that aren't available in Apple Music Classical:

It doesn't support Apple Music Voice: Subscribers to the cheapest Apple Music subscription will need to upgrade their plan to Student or Individual to get access.

You can't shuffle songs: The long-standing shuffle feature isn't available in the Apple Music Classical app.

The full libraries don't sync: While albums, playlists, and tracks added to your Apple Music Classical library will sync to the main Apple Music app, recordings, works, and composers can only be accessed in Apple Music Classical.

It's online only: You can't download music in the Apple Music Classical app, though classical tracks, albums,
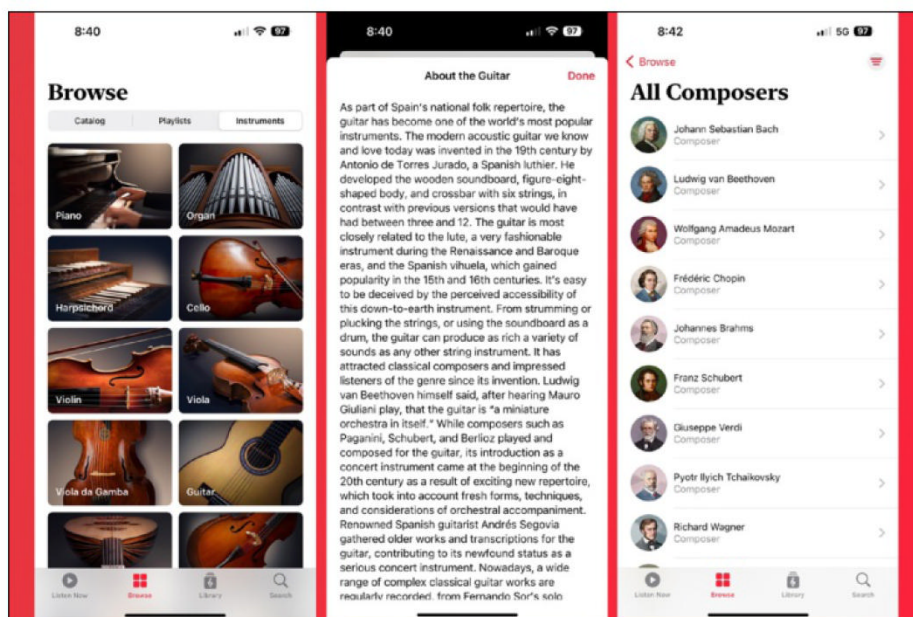
The Apple Music Classical interface is very similar to Apple Music, but there are some restrictions.

and playlists can be downloaded using the main Apple Music app. The library is limited to classical music: The Apple Music Classical library will only show songs from the classical music genre, and you'll need to hop over to the main Apple Music app to play anything else.

It's not available everywhere: While Apple Music is available in most countries that offer Apple Music, a few are notable excluded: China, Japan, Korea, Russia, Taiwan and Turkey.

I**t's iPhone-only:** At launch, the only way to get Apple Music Classical is on the iPhone. So iPad, Mac, Apple Watch and Android users are out of luck. However, Apple does say an Android version is coming soon.

An Apple Music subscription costs £10.99 a month for an individual or £16.99 a month for a family. The student plan is £5.99.

Apple acquires content-aware AI video compression start-up

Firm's 'content-aware' approach to video compression and decompression could bring TV+ improvements. **David Price** reports

Apple acquired a start-up specializing in AI-based video compression earlier this year, it has emerged, but it isn't yet clear how the company plans to use the technology.

As is generally the case when Apple makes an acquisition, there has been no official announcement from Cupertino, nor have the terms of the deal been disclosed. In this case, however, a co-founder at the

acquired firm, WaveOne, wrote about the acquisition on LinkedIn (fave.co/40qN8py), in a post that TechCrunch discovered (fave.co/3MO7vpf) and recently reported:

"Last week we finalized the sale of the company to Apple. We started our journey at WaveOne, realizing that machine learning and deep learning video technology could potentially change the world. Apple saw this potential and took the opportunity to add it to their technology portfolio."

Aside from the LinkedIn announcement, which evidently didn't make much of a splash when it was originally posted, TechCrunch has also spotted that several former WaveOne employees now work on machine learning at Apple. Despite a lack of official comment from Apple itself, the cat is very much out of the bag.

In a profile of WaveOne back in 2020, TechCrunch explained how the company was using machine-learning hardware like Apple's Neural Engine to accelerate and streamline video compression on mobile devices.

What we don't know for sure is how Apple sees the acquisition playing into its long-term strategy, although there are obvious ways the company could benefit. AI is an area of growing importance within the tech sector, but most companies are focusing on (or talking about focusing on) creative tools along the lines of ChatGPT and improved smart assistants. WaveOne's work, meanwhile, is on the machine learning side and focuses on pragmatic solutions to specific problems. As TechCrunch explains, WaveOne's flagship invention was a "content-aware" method for analysing video files and learning the best way to compress them – prioritizing faces at the expense of boring background elements, for example.

As useful as it is, that's hardly likely to feed into developments to Siri, or to help pave the way to a ChatGPT competitor. But optimizing Apple's TV+ streaming service by reducing its data by just a few percent could lead to major cost savings or improvements to resolution or frame rates.

Political shift appears to give Apple a reprieve in US antitrust move

GOP-controlled House seems to be losing interest in imposing stricter rules on the tech giants. **David Price** reports

After several years of antitrust disputes and investigations across multiple sectors and nations, things are looking up for Apple in the US, where political factors may mean the company escapes further regulation for this year at least.

CNBC reports (fave.co/40oQtFJ) that Apple, along with fellow tech giants Amazon and Google, is

likely to get a "reprieve" because Republican leadership is losing its appetite for the fight to impose strict antitrust regulations. This is partly based on comments from Ken Buck (R-CO), a long-time critic of the big tech companies who was passed over for the position as chair of the Judiciary subcommittee on antitrust. "I don't think Speaker McCarthy, Chairman Jordan or Chairman Massie are advocates for the antitrust, pro-competition solution to the Big Tech problem," he said in an interview, adding that it would be a "fair conclusion to draw" that his bipartisan work co-sponsoring antitrust bills with the Democrats (such as the Competition and Transparency in Digital Advertising Act last May) was what cost him the chairmanship.

Jim Jordan (R-OH), meanwhile, suggested in a separate interview that the GOP is more interested in restructuring the subcommittee to limit the power of the Biden administration than in increasing its powers of oversight. "We're thinking … that we don't want to give any more power to those agencies," he said.

Buck appeared pessimistic about his ability to limit the powers of the tech giants without the subcommittee chairmanship; when asked for his plans, he said: "That's a great question and if you have any answers to that I would appreciate knowing." He did indicate that he intends to introduce antitrust bills on the House side, just as similar bills will be introduced in the Senate, but it seems unlikely that these bills will gain the momentum needed to pass in 2023, given the broader lack of interest among the GOP.

This is all good news for Apple, but the company isn't out of the woods just yet. Interest in alleged anti-competitive behaviour is not confined to the US. Since 2020 the company has been investigated for such matters in Spain, Italy, Russia, France and the UK, and by the EU. As a result, iOS 17 is expected to include the ability to install third-party app stores outside the US.

CNBC notes that Republicans have not entirely lost interest in pursuing the tech giants for perceived misbehaviour. Rather, it's just that this is now largely confined to the alleged censorship of conservative voices on tech platforms, a long-running obsession of the party. Rep. Jordan, the site reports, has subpoenaed the CEOs

of Alphabet, Amazon, Apple, Meta and Microsoft in a bid to "understand how and to what extent the Executive Branch coerced and colluded with companies and other intermediaries to censor speech".

It's notable that when Tim Cook and other CEOs appeared before the US House Judiciary Antitrust Subcommittee back in 2020, politicians from the two parties did not pull together, with Republicans focusing on censorship and Democrats on disinformation. Consequently, Apple largely escaped unscathed amid the confusion.
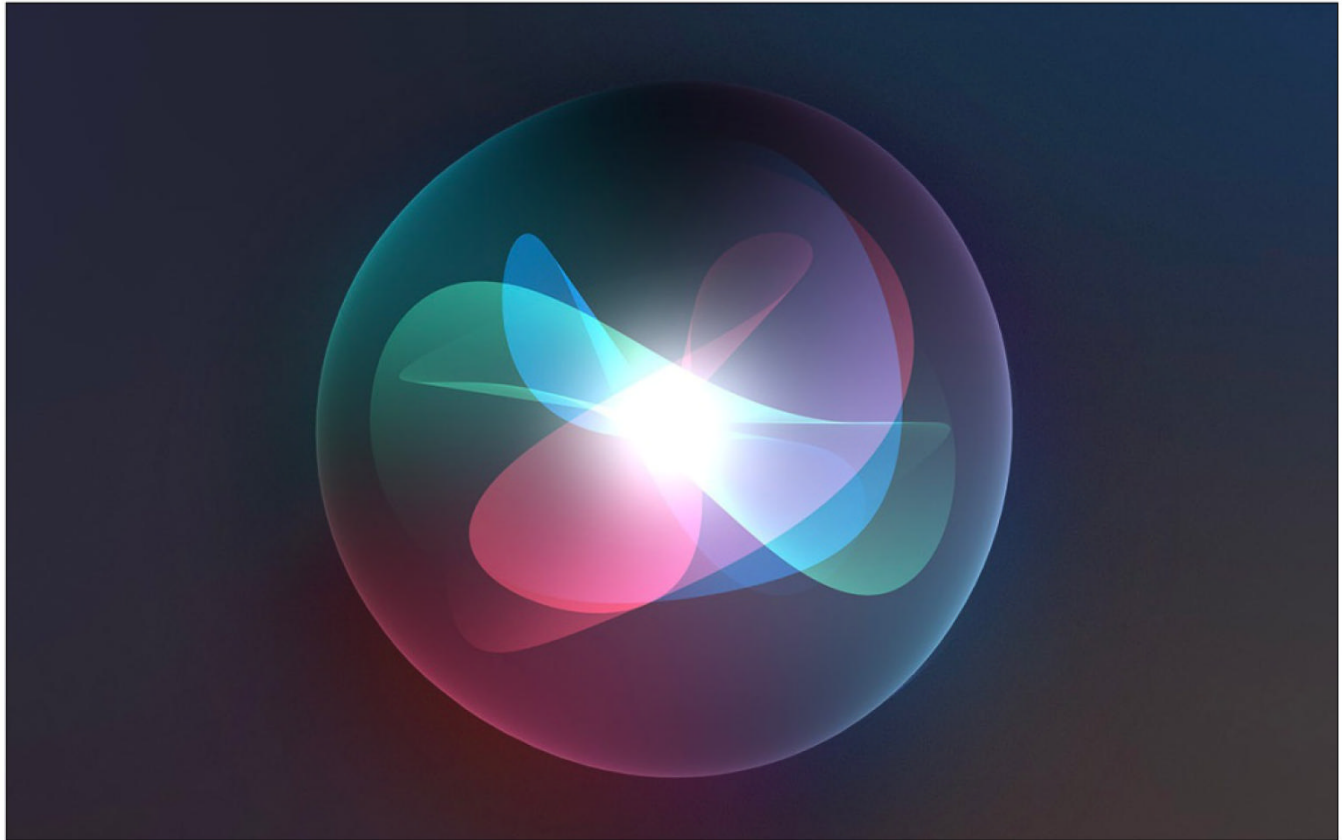
Apple reportedly working on a next-gen 'Botcat' language generation for Siri

The test code uncovered in the latest tvOS beta is limited, but could expand to other devices in the future. **Jason Cross** reports

t seems as though everyone but Apple is jumping on the AI bandwagon, but according to a report, that might not be the case for very long. As uncovered by 9to5Mac (fave.co/3z8oPAH) in the tvOS 16.4 beta, Apple is testing new language generation AI capabilities for Siri. The technology, code-named 'Bobcat', is very limited in scope right now, but could eventually expand to greater capabilities and devices.

A recent *New York Times* report (fave.co/3z717oy) explained how the original trio of AI assistants – Siri, Google Assistant and Alexa – are very limited in their capabilities and have been soundly surpassed by generative AI based on large language

It makes sense that Apple would test on tvOS first.

models like ChatGPT. ChatGPT's capabilities have captured the imagination of the tech community and, together with generative AI like Midjourney, Dall-E, and Stable Diffusion, have inspired something of a gold rush for generative artificial intelligence. The *New York Times* mentioned that, according to its sources, "Many engineers, including members of the Siri team, have been testing language-generating concepts every week."

Now it seems that 9to5Mac has discovered that Apple has enabled a new framework for 'Siri Natural Language Generation' in the latest tvOS 16.4 beta.

One shouldn't expect this new 'Bobcat' language generation AI
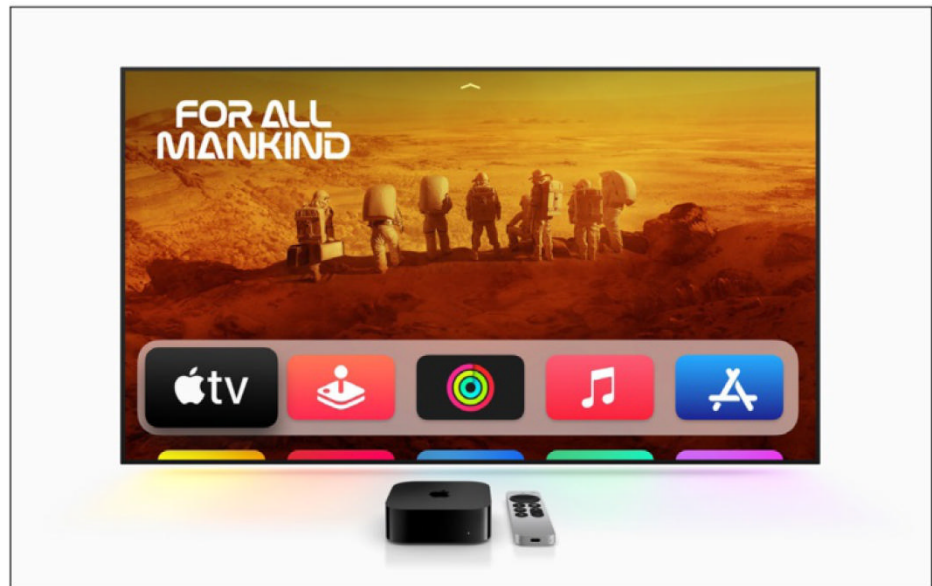
to necessarily be something like ChatGPT, but will more likely be a way to enhance the capabilities of Siri. Currently, the technology is reportedly only enabled when asking Siri to tell jokes on Apple TV with the latest tvOS 16.4 beta, but the report claims that "The company is experimenting with how language generation could be used for timers, as well."

IS SIRIGPT ON THE WAY?
It makes sense that Apple would test on tvOS – it's a small controlled platform relative to iOS or macOS, and the HomePod (which relies almost exclusively on Siri interaction) runs a sort of modified version of tvOS. 9to5Mac says they have seen

evidence that this code has been deployed across iPhone, iPad, Mac, HomePod, and Apple TV, but is only enabled on Apple TV and in a very limited fashion.

But don't expect a chatbot like ChatGPT from Apple anytime soon. At least for now, Apple appears to be interested in using generative language AI technology to make Siri more natural and conversational, and perhaps to enable it to gracefully deliver answers or perform tasks that do not fit the narrowly prescribed conditions for which it has currently been programmed.

It's reasonable to expect that, perhaps with the release of iOS 17 this autumn or one of its point-release updates, Apple will tout a more natural and conversational Siri when performing specific tasks (we don't think Apple's going to stop at joke-telling). Those capabilities will likely expand as Apple works to ensure that its chat model is safe and accommodating for people of all ages and backgrounds, which has been a challenge for models like ChatGPT so far.

How Apple's AI project could bring a long-overdue breakthrough

SiriGPT anyone? **Dan Moren** reports

Artificial intelligence continues to be the latest buzzworthy buzzword floating around the tech industry. (Sorry, blockchain and NFTs, your 15 minutes are up.) And though Apple has plenty of ways that it already leverages machine learning to power up its technologies, it's hard to deny that there are some places where the company could still benefit from jumping on this latest bandwagon.

So it's interesting to hear a report in the *New York Times* (fave. co/3z717oy) that Apple engineers

are actively looking into language-generating AI, similar to the systems that underlie chatbots like ChatGPT, for a number of applications. And a follow-up report by 9to5Mac that confirmed the tech, code-named 'Bobcat', is already being tested for tvOS 16.4 beta (see page 19).

How could this technology be used in Apple's products? Well, as it happens, I can think of a few ways that it might be deployed, not all of which are simply about just creating a chatbot.

HELP, I NEED SOMEONE

Computers have by and large become easier over the past several decades, but it doesn't mean that they aren't still mystifying at times. Anyone who's ever tried to troubleshoot a loved one's haywire device and ended up wanting to break it into a million pieces can probably vouch for that fact.

Apple's long tried to integrate ways for people to find the solutions to their own problems, whether it's via the company's online knowledge base or tools like macOS's universal Help menu. But navigating those systems can be tricky in their own way, and they don't always have the most up-to-date information.

That's one place an AI chatbot could potentially help users. If you could simply type a query about some functionality in a search box and be shown precisely the steps you need to take, that would go a long way toward delivering on the promise of easy technology. And it's hardly out of reach: I already have one friend who regularly uses ChatGPT to help him figure out the right configuration details for arcane command-line tools.

SEARCH & YE SHALL FIND

Apple's never attempted to compete in the Internet search engine market with the likes of Microsoft or Google, but that doesn't mean search as a concept isn't important to the company. Whether it's Spotlight or Siri, people use Apple's search to look for all sorts of information, both on their computers and on the web.

But the more data there is, the harder it's gotten to sift through all the noise to find what someone is actually looking for – as Google and Microsoft are learning. Apple's done a reasonable job with Spotlight, but it certainly feels as though there are cases where being able to interact with it via a chat interface might be more useful. Imagine simply asking

it to "show me all the spreadsheets I've edited in the last month".

Likewise, we've all dealt with the dreaded attempt to search for information via Siri on our Apple Watch or HomePod only to be told that relevant results have been sent to our phone. Or to be simply given a list of websites that may or may not answer your query. What if, instead, an answer could be provided, with more detail sent to your phone? To be fair, Siri has gotten better at this, but the addition of an AI-based chat interface could allow for more power and flexibility than Apple has provided so far.

An AI-based chat interface would make Siri more effective.

TIME TO GET SIRI-OUS

And so we have come to the elephant in the room: yes, Siri. It's already the closest thing Apple has to a chatbot, but anybody who's spent a lot of time with it has quickly realized that the illusion of intelligence doesn't extend very far: it mostly feels like you're just dealing with canned, randomized responses that don't offer a huge improvement over the voice command interface that Apple was shipping back in the Classic Mac OS.

This also means that Siri is ripe for a leap in capability. Rumour has it that the aforementioned language-generation model is already being deployed in the upcoming tvOS 16.4 update, albeit in a limited fashion, both in terms of what aspects it will affect and the fact that it's being used to enhance the existing virtual assistant rather than replace it outright.

While chatbots have their limitations, it's clear that they're a step up over interacting with these conventional voice interfaces, potentially at last living up to the

promise of a truly virtual assistant that can handle complex concepts. Unlike now, where I have to tell my HomePod mini in very precise terms how to turn on my living room lights or risk having lights instead turned on (or off) somewhere else in my house.

Siri was an impressive piece of tech at its debut, but over the past decade, it's clear that it's gotten stagnant, improving only in a meagre fashion. I've been arguing for a Siri 2.0 for more years than I can remember, and that future – one where our virtual assistant adapts to us, instead of the other way around – may finally be within reach.
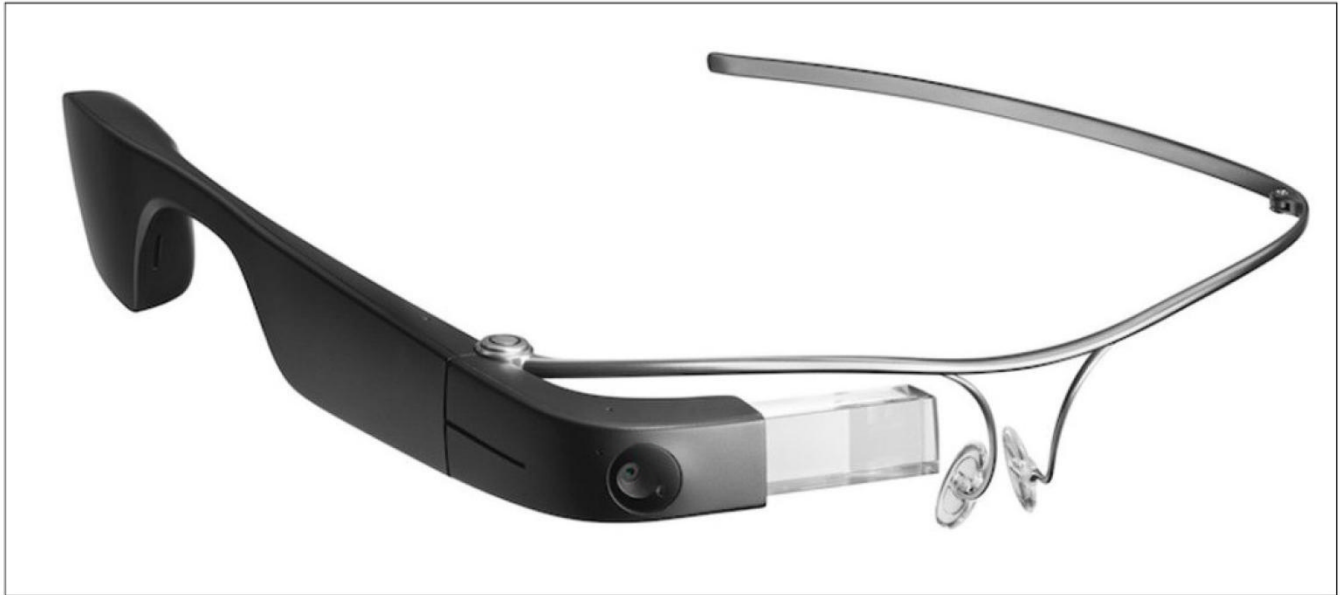
The death of Google Glass is a Reality check for Apple

Will Apple learn from Google's mistakes? **David Price** reports

Google Glass is a failure. That isn't exactly news, but it is now official: the company has finally discontinued the business version of the product, which itself replaced the deeply unpopular consumer devices whose wearers were subjected to mockery and occasional physical violence, and coined the term 'Glass-hole'. An inglorious tale has come to an end, and not a moment too soon.

Then again, the timing is notable and a little surprising because it comes mere months before Apple is expected to make its own entry into the world of face-mounted computing with a mixed-reality headset. (Sceptics may point out that we've been waiting for the headset for years and insist that they will believe it when they see it, but the chorus of leaks and rumours is becoming deafening.) This suggests that one of these two tech giants has completely misread the market: Google thinks it's the right time to get out of augmented reality – or its own vague

approximation of it, as I'll explain in a bit – and Apple thinks it's the right time to get in. They can't both be right.

Google's negative experiences in this field can be salutary for Apple, for which this will be a hugely significant launch with the potential to usher in a wide-ranging ecosystem that one day rivals the success of the iPhone, or to tarnish Tim Cook's legacy forever. Apple needs to look at the things Google got wrong, and the obstacles it was unable to overcome, and find a different path… or simply hope that the market has changed enough that the same methods will now be more successful. That's where the importance of timing comes in.

The single biggest problem facing both companies, Google then and Apple now, is how different a face-mounted device is from the tech products we spend most of our time using. The introduction of tablets and smartwatches essentially reproduced the experience of the smartphone on a larger or smaller screen and didn't require a paradigm shift in the user's relationship with the device. It was still a smallish glowing rectangle concealed somewhere about your person which you took out and looked at when it required attention. But a pair of smart glasses or particularly a mixed-reality headset demands a relationship with technology, and with the world around you, that is unprecedented in most users' lives.

Google Glass was an 'in your face' object in more ways than one and managed to make its users look like hipster show-offs, mad futurists, and Orwellian informants at the same time. And this was a comparatively discreet product that at least somewhat mimicked the appearance of a regular pair of spectacles. How much more annoying will passers-by find a mixed-reality device that covers your eyes and much of your head? How long will it be before a Reality One user gets openly mocked?

The hope, here, is that the world has moved on and that Google Glass was considered especially provoking because it was ostentatiously new. Apple can benefit in this regard from Google's unselfish work getting the world used to smart glasses, which no longer seem quite as space-age as they did in 2013. Furthermore, when a product's user base hits a critical mass it no longer seems odd. Apple will be hoping to normalize its headset through a combination

of weight of sales and marketing know-how. Plenty of people thought 'iPad' was a hilariously bad brand name until all of their friends suddenly owned one.

The key here, and the way to avoid Google's mistakes, will be both to deliver the benefits of AR and to make the public know what those benefits are. Because, as my colleague Jason Cross points out, Google Glass wasn't really an AR product at all. Rather it was a fancy heads-up display with no ability to interact with real-world objects. And so its users were accepting the public shame of wearing an AR device without seeing such a product's benefits. It was all pain – literally, in some cases – and no gain. It's perhaps no coincidence that Microsoft's HoloLens, which really is an AR device, is still going strong, or at least still going.

Apple won't, I suspect, be happy with a niche role in the corporate sector like that carved out by HoloLens, or in medical or educational settings, but that still leaves us without a clear understanding of what Reality One's killer consumer app will be. Bearing in mind that it will also offer virtual reality features, one possibility is

home gaming, but there remains the suspicion that Apple doesn't really understand the gaming market, and that VR gamers will have far better and likely cheaper options elsewhere. It could also give Apple its way into the metaverse, as nauseating as that word is to even type.

But the most promising point is this: thanks to its many talented app developers, Apple doesn't necessarily have to decide what the product is for. It just has to put the hardware out there and see where the community takes it. Maybe it will be used primarily for gaming, maybe social or educational, or maybe users will abandon the outside world entirely and take refuge in an imagined universe free of poverty and hate. If you build it – and build it properly – they will come.

It's probably worth making sure the name of the product doesn't lend itself to an obvious insult, however.

WWDC 2023: Everything you need to know about Apple's dev conference

The products and software updates to look forward to at Apple's keynote. **Karen Haslam & David Price** report
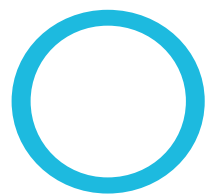
Of the big Apple events of the year, WWDC is the most reliable: in each of the past 16 Junes, like clockwork, Apple has held a big get-together for its developer partners and announced a raft of important software updates. The September iPhone launch and the March/April spring event seem almost unpredictable by comparison.

Over the following pages we list the major announcements (and some of the smaller titbits) you can expect

to hear about at WWDC 2023 this June. Some of these – updates to the five big Apple operating systems, most obviously – are as predictable as the timing of the event. But we reckon Apple will spring a few surprises too.

At the time of writing, we don't know when WWDC 2023 will kick off, but 5 June is a strong possibility for when Apple will hold its opening keynote. We don't know if it will have an audience – last year the event was pre-recorded but Apple allowed some developers and students to watch the keynote live at Apple Park – but the event will be streamed live for the world to watch.

WHAT IS WWDC?

WWDC stands for the Worldwide Developers Conference and is dedicated to the third-party software developers that create apps for Apple's platforms: iPhone, iPad, Mac, etc. Apple invites developers to participate in a series of classes, workshops, and sessions to learn about the system-wide changes coming the major software platforms in the coming year so they can update their apps.

WWDC is a week-long gathering, beginning with a keynote speech on Monday morning. It generally happens in early June, although the Covid pandemic led to a slight delay in 2020. In reality, while devs are at the heart of the event, it's also a press event that Apple uses to announce its software plans and potentially some new Macs and other products to the world.

WHEN IS WWDC 2023?

Based on previous years, we expect it to kick off on 5 June with a keynote event that will start at 10am in California: 6pm BST. The dates of the event will likely be announced in late March or early April, with more details arriving closer to the kick-off.

HOW TO WATCH WWDC 2023

Apple will live stream the opening keynote for all on its website (check Apple's events page) and elsewhere, such as on YouTube and on the Apple TV app. This means you'll be able to watch the presentation on iPhone, iPad, Mac, Apple TV and even PC.

HOW TO GET TICKETS

Some lucky developers will be able to watch the event live in person, but there will be a lot of competition for those tickets. Apple usually holds a

ballot to give everyone who needs to be there a chance to apply for a ticket, which usually ends in mid-May. WWDC keynote tickets have been free for the past few years, but previously cost $1,599 for developers to attend and sold out very quickly. In 2022, developers were invited to watch the keynote live at Apple Park, though the event was still pre-recorded.

Even without a ticket, all registered Apple developers get access to session videos, slides and sample code throughout the week.

SOFTWARE RELEASES

WWDC is all about the software, so we can be certain that Apple will reveal details of its upcoming operating system updates for iPhone, iPad, Mac, Apple TV, HomePod, and Apple Watch. Those updates will then be issued to developers as a beta to test, then a few weeks later a public beta will start. Eventually, the new software will be available for everyone to download in the autumn (usually September for iOS/iPadOS/watchOS and October for macOS). Here's what to expect:

Apple will unveil the next generation of its operating systems at WWDC.

iOS 17

The headliner of the event simply because of the sheer number of iPhone owners across the planet. If you've got an iPhone made within the past five years, you'll likely be able to install the new version of iOS when it's released in the autumn of 2023.

But before then, there's a whole beta-testing cycle to get through. iOS 17 will be announced at WWDC 2023, then released as a developer beta (for registered app developers only) almost immediately after the keynote. Developers will then be able to install the iOS beta and a few weeks later a public beta version will be made available for all users who want to try the new features.

Our advice is to be cautious and prepared for serious flaws with the beta software – it might even brick your device.

Over the course of the next few months, the developer and public betas will go through a testing process where features will be tweaked, changed, fixed, and updated until we reach the finished iOS 17.0 public release, most likely in September.

iPadOS 17

The accompanying update for iPad owners, iPadOS 17, is likely to incorporate most of the new features of iOS 17 but adapted to a larger-screen interface. When Apple's two mobile operating systems split in 2019 they were similar in most respects, but the iPad version is heading steadily into its own realm.

In 2022, Apple released iPadOS 16 a month after iOS 16, so it's possible that the two versions don't arrive at the same time.

macOS 14

This should be macOS version 14.0, but what is less predictable is the California landmark Apple will name the version after. So far we've had: Mavericks, Yosemite, El Capitan, Sierra, High Sierra, Mojave, Catalina, Big Sur, Monterey and Ventura. Prior to the California-based names Apple named 10 versions of the Mac operating system after big cats. Could this be the year Apple makes another big change in its naming convention?

watchOS 10

This is more of a niche than the iPhone, iPad and Mac updates discussed above but could bring more health and fitness features to Apple Watch owners around the world. Last year's watchOS 9 update was available for those running a Series 4 or later. If you've got a Series 4 or later, hopefully, the same will be true of watchOS 9.

tvOS 17

The lowest-profile of the five big Apple operating systems, tvOS is the platform that runs on the Apple TV.

Probably the biggest addition in last year's tvOS 16 update was support for Matter-compatible devices and support for more gaming controllers. What will we get this year? You'll find out at WWDC.

HomePod software Version 17

Apple is also likely to update the
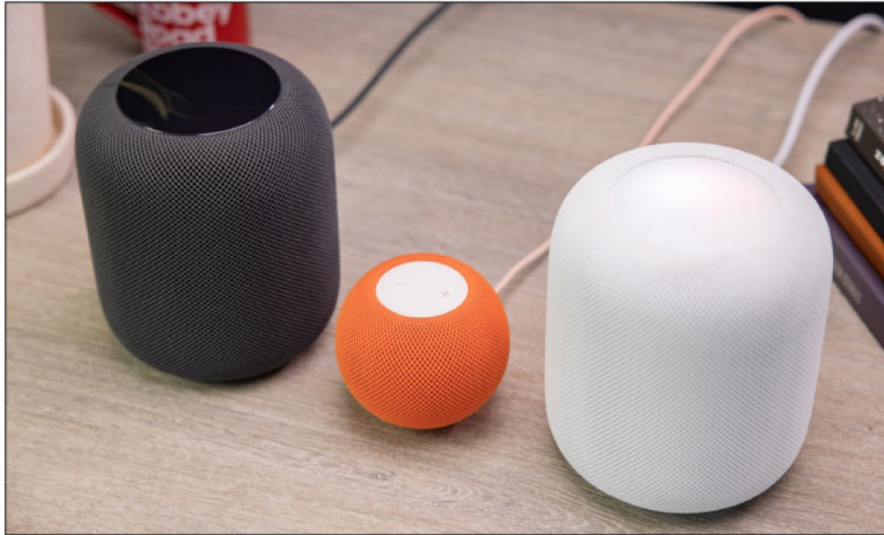
The HomePod will likely be among the products getting a preview of new features coming later in 2023.

software on the HomePod and HomePod mini alongside the other operating systems. In 2022 Apple introduced HomePod Software Version 16 which didn't bring a lot of new features at the time, but a later update: HomePod Software Version 16.3 brought temperature and humidity sensing to the HomePod mini and more. We may hear more about Apple's plans for the HomePod during the WWDC event – especially as Apple is rumoured to planning big changes to the HomePod in 2024.

HARDWARE RELEASES

WWDC tends to be a software-focused event, but Apple has often found time during its WWDC keynotes to launch hardware products too. The first few iPhone revisions – iPhone 3G, iPhone 3GS, iPhone 4 and iPhone 4S – were all released at WWDC, and the HomePod had its unveiling at the event in 2017 as well.

However, the event has focused on Mac releases in recent years. Apple unveiled the iMac Pro in 2017 alongside updates to the iMac, MacBook and MacBook Pro, and announced a new Mac Pro and the Pro Display XDR in June 2019. At WWDC 2020, Apple announced the transition from Intel to Apple silicon, and WWDC 2022 saw Apple launch the M2 chip in the MacBook Air and MacBook Pro. What's in the hardware pipeline for Apple right now? Here's what we hope to see:

Reality Pro headset

This is the big one. Apple has been rumoured to launch a new AR/VR headset for years, and it is finally expected to arrive sometime in 2023, and WWDC has been floated as a possible date. With an extremely high price tag, the device is expected

to be mostly geared toward developers, so WWDC would be a great opportunity for Apple to debut the new device, even if it doesn't launch until later in the year. The headset is rumoured to look like a pair of ski goggles, with 8K displays, numerous cameras, and an external battery pack, with a price tag that could top £3,000. However, it will be one of the most important product launches in years, as Apple looks beyond the iPhone into a whole new category of wearable device.

It's hoped a new Mac Pro will be announced.

If Apple launches its headset, a major component of the presentation will be the rumoured xrOS, which stands for extended reality. Apple will outline the major features, developer tools, and strategies for the operating system, which is expected to focus on entertainment and communication.

Mac Pro

Over the years, new Mac Pro models have launched at WWDC and this year could be no different. By the time Apple takes the stage at the WWDC event, it will have been three years since it announced its plans to move from Intel to its own silicon, and the Mac Pro is the only Mac that hasn't made the transition.

The latest Mac Pro rumours say the machine will have an M2 Ultra processor and a similar design to the current model.

15-inch MacBook Air

Apple is said to be working on a larger version of the MacBook Air with a 15-inch display and we could see it at WWDC if it doesn't arrive before them. We don't know exactly

what the rest of the machine will bring, but we expect it to be very similar to the current Air, possibly with the addition of an M2 Pro chip.

iMac

By the time of the WWDC keynote, the 24-inch iMac will be more than two years old. A WWDC update would make sense, but the rumours are suggesting Apple is waiting for the M3 chip before it updates the iMac, so that new Mac may not launch until later in the year.

iMac Pro

When Apple launched the Mac Studio in 2022 it also discontinued the 27-inch iMac, but that doesn't mean that the large iMac is dead. In fact, Apple may have plans to bring back the larger iMac. Unfortunately, we think we will have to wait a little longer before we see Apple unveil this new/ old product though.

macOS 14: Every new feature we hope to see at WWDC 2023

Maybe someday, all of our wishes on this list will come true. **Roman Loyola** reports

At the time of writing we're still waiting for the official announcement, WWDC is coming. In just a couple of months, most likely the first week in June, Apple will unveil the next version of macOS and show off all of its new features ahead of its release later this year. Rumours about new features have been light – all we know so far is that Apple has shifted some macOS resources to xrOS –

but there are plenty of features we expect and hope to see make an appearance on the big stage. Here's our feature wish list for macOS 14 [insert name of scenic California locale here]:

DYNAMIC ISLAND FOR THE MAC

With the iPhone 14 Pro, Apple introduced the Dynamic Island, which uses the pill-shaped cutout for Face ID and the selfie camera as an extraordinary UI element. It's an ingenious feature that needs to at least come to the MacBook Pro.

Dynamic Island would alleviate the clutter on the right side of the macOS interface, which houses notifications, reminders, and widgets. But it could also be a great way to monitor the progress of something an app is working on in the background, act as an indicator for battery life, or display what Apple Music is playing, as on the iPhone.

Besides, Apple's 14- and 16-inch MacBook Pro and the M2 MacBook Air

already have display notches, so a trip to the Dynamic Island should be easy to book.

TIME MACHINE iCLOUD BACKUPS

This was on our wish list for macOS 12 and macOS 13, and it's going to stay on every wish list until it happens. As I said before, I'll say it again: having an off-site backup is always a good idea, and Time Machine could be updated to do that along with the option for a local backup.

Since Apple doesn't seem to be interested in adding this feature to macOS out of necessity, allow me to take a different angle: It's good for Apple's bottom line. Think about it, Apple. You could make precious Services money from Time Machine
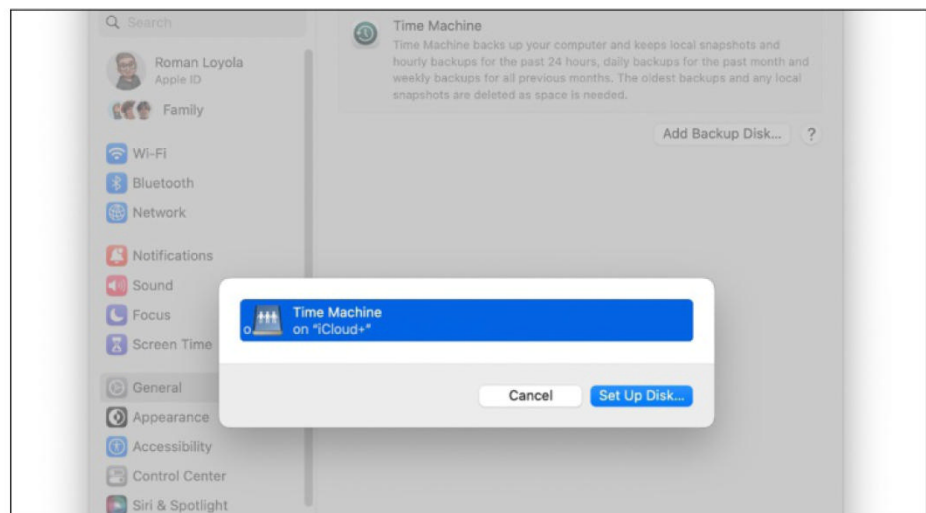
Apple could make a lot of money by offering cloud storage for Time Machine backups.

More iOS apps, such as Wallet, should come to macOS.
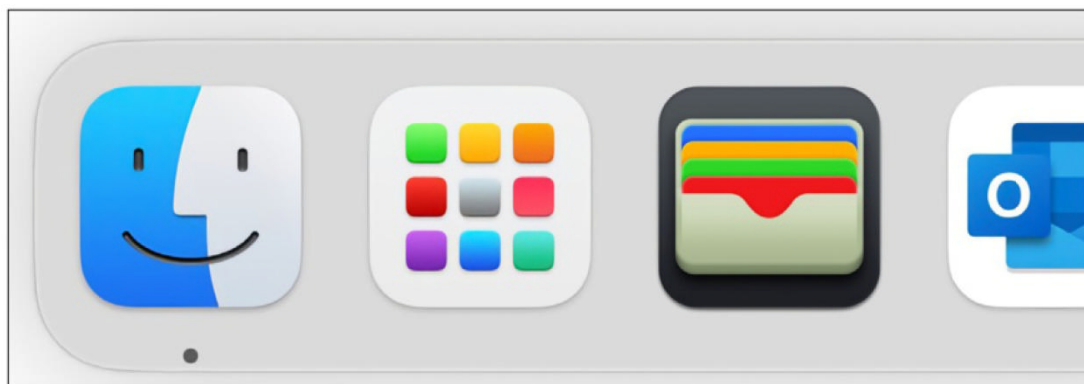
iCloud backups by selling iCloud+ storage. Apple already has a £6.99 tier that offers 2TB of storage – and I could see a new £3.99 for 1TB of Time Machine iCloud+ storage tier. That's about £48 per year, and say, 500,000 users sign up for that. That's a lot of money you're making each year and a lot of happy Mac customers. How can you pass that up, Apple?

FINE-TUNE SYSTEM SETTINGS

In my macOS 13 wish list, I wanted Apple to rename System Preferences to Settings to match iOS and iPadOS. My wish came true, but at a price: Apple took it a step further and redesigned the UI to be more like the iPhone. That caused consternation for the most hard-core Mac fans and confusion among even iPhone users – and sent a lot of Mac users to Google to find settings they thought were lost. There's no going back now; System Settings and its UI are here to stay. But it could use some fine-tuning.

We'd love to see Apple separate the interface from iOS. The look is fine, but some settings don't make sense tucked away behind General or Desktop & Dock. Top on the list: Time Machine (especially if Apple unlocks iCloud backups).

BRING OVER MORE APPLE iOS APPS

With macOS Ventura, Apple finally made Mac versions of the Clock and Weather apps that have been in iOS since forever. Why stop there? There are plenty of iOS apps that aren't available on the Mac: Translate, Clips (which was on my macOS 13 wish list), Health, Wallet (those two were on my macOS 12 wish list), Support… maybe not Compass, Measure and Magnifier. And hey, while they're at it,

revive Warren Buffet's Paper Wizard and bring it to the Mac.

SYNC THE CLOCK APP ACROSS ALL DEVICES

As I just said, with macOS Ventura, Apple finally brought over Mac versions of the Clock and Weather apps that have been in iOS and iPadOS. Yay! However, the Weather app syncs between devices, and the Clock app doesn't. That means that alarms that you set on one device aren't available on others.

It's easy enough to set an alarm, but it would be way easier if those alarms synced across devices. While we're at it, why not sync world clock entries? Or even timers – I create a lot of timers and would like to be able to control them from multiple

devices. Oh, and since everyone might not want their iPhone timers on their Mac, then give us the option to turn syncing off.

UNIFY THE VERSION NUMBER

This version of macOS will be version 14 even though Mac OS X came out in 2001. In the meantime, iOS and iPadOS will eventually upgrade to version 17. And as someone who makes a living off of covering these products, I still get mixed up with the version numbers frequently. If macOS, iOS, and iPadOS were all the same version number, it would save us a lot of trouble.

Admittedly, this is a minor request and many of you reading this probably think it's silly. At the same time, isn't versioning just as silly? After all, it's just a label. Apple already tries to avoid using the number as a general reference point by giving macOS a name after a California location.

I suspect that Apple has some sort of plan for this already in the works as it
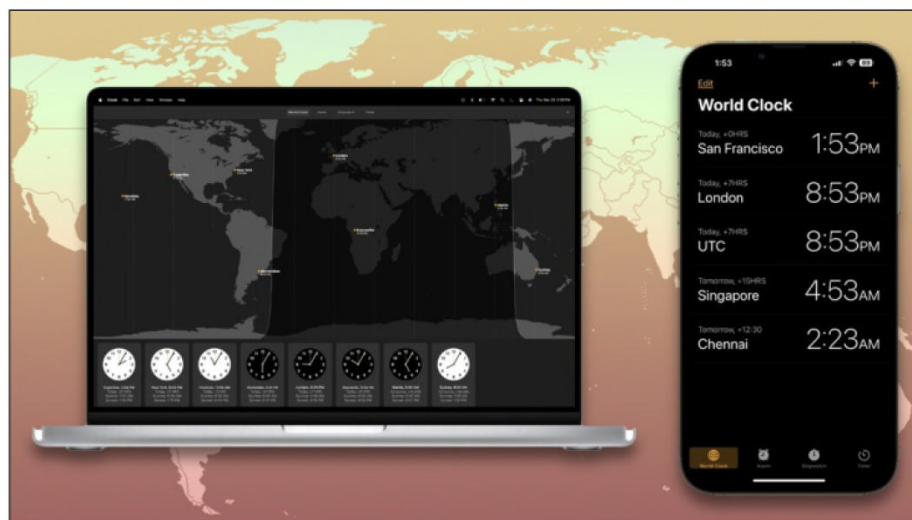
The Clock app arrived with macOS Ventura, but it doesn't sync with the Clock app on iPhones and iPads.

looks to add a new operating system, xrOS, into the mix. But it seems as if macOS and iPadOS are on a collision course (which is a whole different conversation), so perhaps Apple could take the opportunity to align all its OSes on the same number. Maybe 20? (Don't use the release year as a version number, though. Ask Microsoft how that worked out.)

BRING STABILITY IMPROVEMENTS AND OPTIMIZATION

I can keep going with the wishes – a lot of what I wanted in my macOS 12 and macOS 13 wish list have yet to become reality, and I'd still like to see them happen. But reports have said that macOS 14 won't have many major changes, since the company is supposedly focusing on the AR/VR headset and its operating system, rumoured to be called xrOS. Development for macOS 14, iOS 17, and iPadOS 17 (see, wouldn't it be easier to read if they had the same version number?) is seemingly a lower priority until that device is unveiled.

However, Apple won't let 2023 go by without a macOS update. With the focus of the media and users on the headset, this could be the time to do

an update filled with fixes to long-time issues and optimizations – and that's it. If that happens, that's great. MacOS has some lingering bugs and fixing them, along with making the OS overall more stable and faster, would be very satisfying.

Best Mac for gaming

Are Macs good for gaming? In the past the answer would've been no, but that's changed. Here are our top picks. **Karen Haslam** reports

t's something of a running joke among Windows users that Macs are rubbish for gaming. Traditionally, Apple's computers haven't been considered a great choice for gaming. There are Macs that can play games well, but they are generally much more expensive than the equivalent PC. Also, upgrading a Mac to meet the requirements of a graphically-demanding game is a no-no since they aren't upsgradeable.

Macs have, however, become a much better choice for gaming enthusiasts, with the advent of Apple's first M1 chips in 2020, the subsequent M1 Pro, M1 Max and M1 Ultra, and now the M2, M2 Pro and

M2 Max. In the past only the most expensive Macs offered the discrete graphics necessary for gaming. While M-series Macs don't feature discrete graphics, their capabilities are far beyond the integrated options in Intel Macs, and they even beat the best of the discrete graphics cards that were previously included in Intel-powered Macs. With the arrival of the M2 Pro in the MacBook Pro and Mac mini, and the M2 Max in the MacBook Pro, Apple has finally produced a chip that is capable of handling graphics-intensive AAA games.

This means it's no longer the case that Apple's Macs are no good for games. The main problem is that there isn't the wealth of games available for the Mac – let alone the M-series Chip – right now.

There's also the fact that, despite perfectly respectable performance, Macs can't fully compete with purpose-built gaming PCs when it comes to gaming. Even the Mac mini with M2 Pro, which is one of our top choices for Mac gaming right now, would be crushed by a comparably-priced Windows gaming PC.

But, for those looking for a Mac to do all the things Macs can do and be good for gaming, right now there are some great options.

THE STATE OF GAMING ON THE MAC

The main problem is that there aren't a lot of games that are available for Macs, let alone M-series models. It doesn't matter how good a Mac might be as a gaming machine if it won't run the games you want to play.

Pre-M1, we would have talked about how the Mac gaming scene had picked up since Macs started to use the same Intel processors as Windows PCs (back in 2007). Indeed, strong sales of Macs in recent years has helped encourage developers to make more A-List games available on the Mac than ever before.

However, with the arrival of the M1 chip this all changed. With the majority of AAA games starting life on Windows on Intel-powered X86-based PCs, games developers, or publisher such as Feral or Aspyr, now need to write their games for the new ARM-based chip as well as Intel. Porting Windows games to the Mac when they were powered by Intel wasn't a such a struggle because it was the same instruction set. But now that Macs are not based on Intel, the instruction set is further removed from PCs than ever and the job that much more complex.

It's not only the M-series chips to

Blizzard's World of Warcraft can be played on an M1 Mac.

blame here – when it arrived in 2019 macOS Catalina stopped support for 32-bit code – which meant a lot of games that used 32-bit code were no longer Mac compatible. At the same time Apple also introduced Metal for 3D graphics. So even before the arrival of the M1 a lot of games developers had already decided against making new Mac versions of their games.

The good news is that not all developers need to rewrite their code for the M-series chips. Apple has developed Rosetta 2, a dynamic binary translator that translates instructions from Intel to ARM so that the software can run on M-series Macs. Thanks to Rosetta a number of games are working on M-series chips,

although they don't all work perfectly.

Some games developers have made native versions of their games for the M-series Mac. There's a number of Mac games that run natively on the M-series chip. Blizzard's World of Warcraft, for example was M1 ready when the M1 Mac launched, and Gameloft's Asphalt 8 and Asphalt 9 both run natively on the M1.

There are now 248 native games, and many more that run well through Rosetta, according to this list (fave.co/3KgIgOB). You can play Banner Saga, BioShock 2 Remastered, Borderlands, Diablo III, Final Fantasy XIV, Hogwarts Legacy and more via Rosetta.

Fortnite was a popular game that runs on M1 Macs via Rosetta. However, thanks to Epic's fall out with Apple the developer is no longer issuing updates to the game.

The following Aspyr games run via Rosetta: Borderlands 3, Call of Duty, Civilization VI and Planet Coaster. Aspyr was bought in February 2021

by Embrace Group for $100 million, which says it will accelerate Aspyr's growth and license even more games.

A number of Feral releases are also playable via Rosetta on the M1 Mac. These include A Total War Saga: Troy, Deus Ex: Mankind Divided, Dirt and Dirt Rally, and Shadow of the Tomb Raider, which run reasonably well.

The Mac version of Shadow of the Tomb Raider can be bought from Steam.

Steam is another source of gaming on the Mac. The platform is compatible with Apple's M-series chips, but not every game in the library will run on M-series Macs.

For Intel Macs, Apple has a cunning trick up its precision-engineered sleeve in the form of Boot Camp. Installing Windows via Boot Camp means it is possible to play Windows games on an Intel-based Mac. Alternatively, Parallels or VMware might have been considered options for PC gaming on a Mac.

Unfortunately, if you have an M1 or later Mac, Boot Camp is no longer offered, and Parallels and VMware aren't able to run the Intel version of Windows on the M1 Mac (Parallels can run the ARM version of Windows, but that's still in development and the games you'd be looking to run won't run on that anyway).

If you really want to run un-ported Windows games on an M-series Mac Crossover Mac from Codeweavers (fave.co/3nrCi4a) is a good option. It can translate x86-64 code for Windows to ARM64 code for macOS.

If that doesn't appeal, then you will have to wait for Feral Interactive, Aspyr and others to port PC games to M-series Macs.

All this may mean that fewer PC games come over to the Mac, but perhaps this doesn't matter. ARM-based Macs will natively be able to run any iOS or iPad app, which should bring a number of games over to the Mac from the iPhone

and iPad, so far there are around 60 iOS games playable on the Mac including: Among Us, Alien Isolation, Call of Duty: Mobile, Dragon Quest VIII, Grand Theft Auto, Minecraft, Monument Valley, Need for Speed No Limits, Stardew Valley and X-Plane Flight Simulator.

Even more interesting: some games machines, such as the Nintendo Switch, run on ARM processors, meaning it is theoretically possible to run Switch games on the M1 Mac.

That's the state of Mac gaming right now. If you want to play games on the Mac you can, but there are limits depending on whether you have an Intel processor or an M1 Mac. But in the long term there is the promise of a wider catalogue of games coming to the M1 Mac.

So, with all this interactive entertainment available to the prospective buyer, which Mac should you choose.

GAMING ON THE MAC: WHAT YOU NEED

Playing the latest games places heavy demands on a computer, both in terms of graphics and processor performance. To ensure you have the best platform for your digital adventures you'll obviously need a machine that has a fast processor (CPU). You can find 12-core CPUs in the M2 Pro and M2 Max, while the Mac Studio with M1 Ultra offers a 20-core CPU.

It also helps to have a powerful graphics processor. While casual games use simple two-dimensional graphics that don't require too much graphical power, the detailed 3D graphics used in high-speed action games can put a lot of strain on your machine. The GPUs on offer from Apple include 16- or 19-core GPUs in the M2 Pro, 30- or 38-cores in the M2 Max, and 48- or 64-cores in the M1 Ultra powered Mac Studio.

We also recommend at least 16GB RAM, although our advice would be to get the most RAM you can afford at the point of sale, as it's impossible to update later. You can get up to 32GB unified memory (Apple's name for RAM) with the M2 Pro (in the MacBook Pro and Mac mini), up to 64GB RAM in the M1 Max in the Mac Studio, and up to 96GB RAM in the M2 Max (in the MacBook Pro), and a massive 128GB with the M1 Ultra (Mac Studio).

A decent display is also going to be a bonus, but since nearly every Mac (bar the Mac Studio and

Mac mini) has a high-resolution Retina display, you can be sure that games will look great on your Mac.

A fast and a reasonably high-capacity solid-state drive is a good idea too as games can take up a lot of gigabytes, and it will improve gaming performance. Luckily, Apple no longer sells any Macs with hard drives or the Fusion drive that combined a hard drive and flash storage, but it's worth noting that some Macs have slower SSDs than others. It's generally the entry-level models with 256GB storage that are affected by this, although it seems that the 512GB MacBook Pro is also affected. With this limitation in mind it could be wise to get at least a 1TB SSD, if you can afford to.

Another thing to look out for is how well the computer will handle the processor intensive games. For example, we wouldn't recommend the MacBook Air because, although the MacBook Air might look like it has similar specs to the 13-inch MacBook Pro, it lacks fans so it may slow down to avoid overheating.
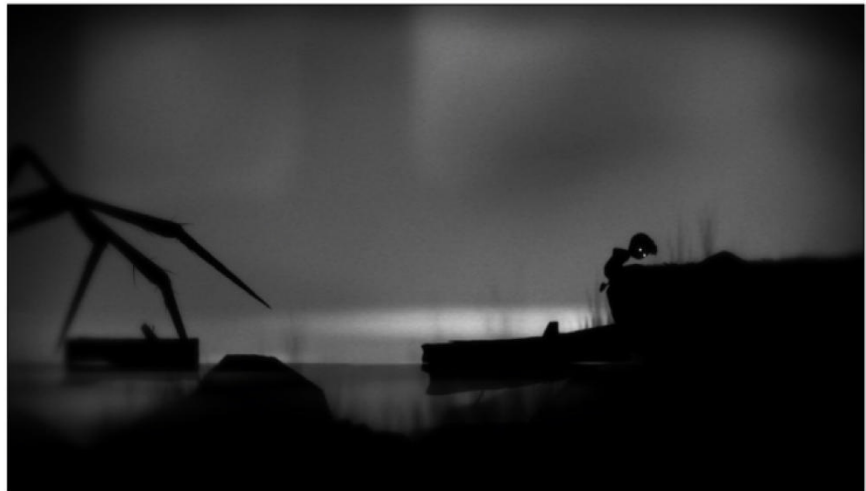
Even if you have an older Mac, you'll be able to play less demanding games, such as Limbo.

We'd also recommend a comfy gaming chair, some snacks that can be eaten one-handed and the occasional break to save your spine from developing an unusual shape.

In the Intel Mac world you'd need an Intel Core i5 or Core i7 running at 2.0GHz or more. You would also need a decent, discrete graphics card. One option for non-M1 Macs is to plug in an eGPU to add a discrete GPU to your Mac and benefit from the improved graphics capabilities, unfortunately, the M-series Macs won't work with an eGPU.

MACS GAMERS SHOULD AVOID

Graphics performance will obviously vary depending on the type of games you like to play. The general rule of

thumb is that if you intend to play fast 3D action games then you should consider the M2 Pro, M2 Max or M1 Ultra. The M2 might be sufficient for some gamers, especially those on a budget, but if you can afford to go pro you would be wise to.

Some Macs simply won't have the power to run graphically demanding titles and frame rates will quickly drop to almost unplayable levels when there are lots of characters battling it out on the screen. That reliance on integrated graphics means there are several Mac models that gamers will probably want to avoid if they want to play graphically demanding games. Of course, if your primary form of entertainment is less demanding fare such as Football Manager, Limbo or many of the indie games you'll find on the Mac App Store, then pretty much any Mac will fulfil your needs – as would an iPad.

These Macs would be sufficient for casual gaming, but we recommend you avoid them if you want to play graphically demanding titles:

- Intel Macs
- 24-inch iMac
- Mac mini (M2 or older models)
- MacBook Air (M2 or older models)

- 13-inch MacBook Pro (M2 or older models)
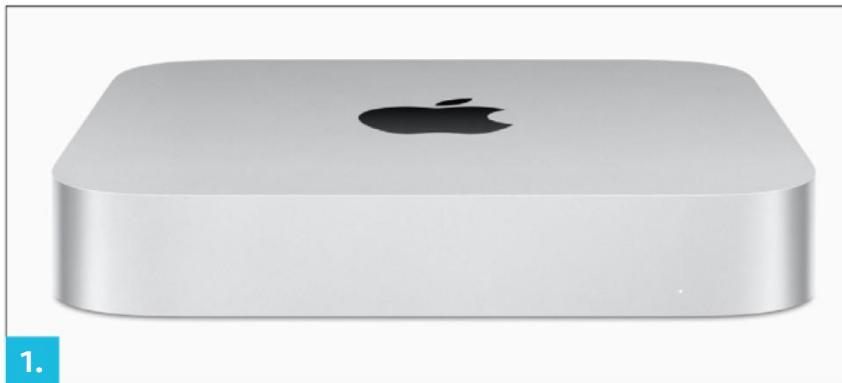
MACS GAMERS SHOULD CONSIDER

We've ruled out a fair selection of Macs, so now let's look at some Macs that you can consider if you want to play the latest 3D games.

- 14-inch MacBook Pro with M2 Pro (10-core CPU, 16-core GPU)
- 14-inch MacBook Pro with M2 Pro (12-core CPU, 19-core GPU)
- 16-inch MacBook Pro with M2 Pro (12-core GPU, 19-core CPU)
- 14-inch MacBook Pro with M2 Max (12-core CPU, 32-core GPU)
- 16-inch MacBook Pro with M2 Max (12-core CPU, 38-core GPU)
- Mac Studio with M1 Max (10-core GPU, 24-core CPU)

BEST MAC FOR GAMING

The lack of games that were ready for the M1 Mac, either to run natively, or to run reasonably well via Rosetta, was a problem for some time, but the situation has improved, so it is easier to recommend M1-series Macs for gaming.

We like the Mac Studio, if you opt for the M1 Max model (the Ultra is over kill) then you can get a

1.

2. Apple 14-inch MacBook Pro (M2 Pro, 12-core/19-core, 1TB)
Price: £2,699 from fave.co/42N9LWX
The 14-inch MacBook Pro with M2 Pro chip is a good option for gamers. We suggest that if your budget runs to it you should opt for the mid-range model that comes with 1TB SSD, 12-core CPU and 19-core GPU. That way you avoid the slower SSD of the entry-level model, and get the extra GPU cores. For the same price you could by a 16-inch MacBook Pro with the same M2 Pro configurations, but only a 512GB SSD. You may decide you prefer the larger screen, but an external display might be a better choice.

decent deal compared to the M1 Pro MacBook Pro. As long as you don't mind buying a display to go with it.

1. Apple Mac mini (M2 Pro)
Price: £1,399 from fave.co/3Khe8lH
If you want a Mac that is powerful enough to run graphically intensive games without breaking the bank the Mac mini with M2 Pro is a good option. Even Apple is claiming that it's a great gaming computer. The M2 Pro chip can handle modern AAA games and offers perfectly respectable performance. With prices starting at £1,399 for the M2 Pro model with 10-core CPU and 16-core GPU this is the cheapest way to get a powerful enough Mac for gaming.

2.

3.

3. Apple 14-inch MacBook Pro (M2 Max, 12-core/30-core, 1TB)

Price: £3,349 from fave.co/3GOWDUs

There is a 14-inch MacBook Pro with an M2 Max chip available. It isn't cheap, starting at £3,349 but it offers you a 30-core GPU and 32GB unified memory as standard. There is a 38-core GPU and 64GB and 96GB RAM build-to-order options available, but they are probably overkill. The 16-inch MacBook Pro offers the same M2 Max options, although the 38-core GPU is standard there.

4. Mac Studio (M1 Max)

Price: £1,999 from fave.co/3KgRav3

The Mac Studio is another option to consider if you want powerful Mac without if costing you a fortune. The Mac Studio with M1 Max costs from £1,999, so considerably less than

the M2 Max MacBook Pro models and cheaper than the M2 Pro models. With 10-core CPU and 24-core GPU this is a good way to get a Mac you can use for gaming if you already have a decent display.

If you really want a good gaming machine you are looking at a very high starting price – and that is the reason why Macs have a reputation for not being good for games. For the price of a M2 Pro Mac mini, you could get a serious Windows-based gaming PC that is better suited to gaming, and still have change left over for a couple of games too. But, if you want a Mac that does gaming well in addition to everything else that makes a Mac great then these Macs will do the job with style.

4.

Top 25 Mac games

These are the best Mac games available right now to play on your Mac, from RPGs to racing, shooting games to puzzles. **Cliff Joseph** reports

Unfortunately in recent years a number of great games for Mac have declined because many are no longer supported. Every new version of macOS tends to break a few games, but macOS Catalina in 2019 meant that lot of games that used 32-bit code were no longer Mac compatible.

At the same time that Apple went 64-bit only it also introduced Metal for 3D graphics, which left a lot of games developers with a decision: make new Mac versions of their games or stop making them. Unfortunately many chose the latter.

However, despite this and contrary to popular belief, Mac gamers still have plenty of top games

titles to choose from – indeed, the most difficult part is narrowing down the options, and then finding the money to buy and time to play them. We can't help with the latter, but the first problem is right up our alley. We've collected the 25 of the best Mac games for your delectation, including five new games for 2023.

1. SINGLE-PLAYER RPG
Baldur's Gate 3
Price: £49.99 from fave.co/3TQx9yJ
The original Baldur's Gate games were classics of the RPG genre when the series was launched almost 25 years ago, but their 2D graphics haven't aged well, despite an HD update in 2012. However, the forthcoming Baldur's Gate 3 brings the series well and truly up to date with slick 3D graphics and a vast adventure that looks set to match the epic scale of its predecessors.

It's actually been available in 'early access' on Steam since 2020, but the game finally has a firm

release date for August 2023 so you can now dive in and test drive the early chapters of the game to prepare yourself for the arrival of the full game in just a few months time. It's not a true sequel as the story and the main characters are all new – set more than 100 years after BG2 – although it is still set in the famous Baldur's Gate region from the popular Dungeons & Dragons table-top games (and – spoiler alert – some familiar faces do make a welcome reappearance).

Rather than the powerful, god-like being that you became in Baldur's Gate II, the new game lets you start from scratch with an entirely new character, chosen from the traditional D&D selection of races and classes – humans, elves, dwarves, wizards, warriors and rogues – and you then

awake to find yourself prisoner on a flying ship controlled by Mindflayers (a familiar villain from D&D lore). The ship is attacked by dragons, but you're able to escape – only to find that a Mindflayer larva has been implanted inside your brain. So, along with other survivors from the crashed ship, you set out to try to find a cure and then quickly find yourself embroiled in a mysterious war between the Mindflayers and an assortment of enemy races – who won't be fully revealed until the game's launch in the summer.

The 3D graphics really bring the game to life as you and your companions wade into combat, but the spectacular visuals do need a fairly fast Mac in order to run properly. The developers says that the game will run on an Intel Mac with a quad-core CPU and an AMD graphics card, or on most Macs with M1 or M2 processors. However, we had to drop the resolution to just 1600×900 on our M1 iMac in order to get a playable 25fps, so an M1 Pro or higher might be better. Fortunately, the game's turn-based combat doesn't require lightning reflexes and high-speed action, so you can still get by with an M1 Mac if you need to.

The decision to opt for turn-based

combat might worry old-timers – like yours truly – who remember the terrific real-time-with-pause system of the original games. But turn-based is the trend these days, and if my time in the early access game is anything to go by then you'll find that the old Baldur's Gate magic will soon tempt you in as you 'gather your party before venturing forth' – just like the good old days!

2. SUBSCRIPTION-FREE MMO
The Elder Scrolls Online
Price: £15.99 from fave.co/3Kis3sO
Along with World Of Warcraft, The Elder Scrolls Online – or ESO to its thousands of fans – is one of the few A-List MMO titles that still supports the Mac (sadly, we lost Guild Wars 2 a couple of years ago…). But, unlike WoW, you don't need to pay a monthly subscription to play the game, which makes it great value for players who want to immerse themselves in hundreds of hours of quests and adventures in the game's online world of Tamriel. Some people also prefer its grittier graphical style to the Disney-esque cartoon graphics of WoW.

ESO keeps its fans coming back year after year by releasing regular

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You can buy the base version of the game for £15.99, or buy the High Isle Collection, which includes High Isle and all the previous chapters for £42.99. Or, if you already own the game, you can just upgrade with High Isle on its own for £24.99. Once you've bought the game you can play for as long as you want without paying a monthly subscription, and there are enough dungeons and quests already available to keep you busy for years. However, you can pay for an optional subscription if you want ($14.99/£8.99), which provides bonuses such as a larger inventory for storing all your gear and some extra gold coins to spend in the game's online store.

The Mac version of ESO did have a wobbly patch, around the time of Catalina, but it now runs well on both Intel and Apple Silicon Macs, and we were able to get a playable 30fps from the game at 1,920×1,080

expansions – which it refers to as Chapters, as each new chapter brings a new story and a new series of quests to the game, as well as opening up new zones for you to explore. The latest chapter is High Isle, which takes you to the homeland of the game's Breton race, and throws you into a story of political intrigue involving High Isle's rival factions and a mysterious organization known as the Ascendant Order. Other new features include a new deck-building card game that you can play to while away a few hours, and two new computer-controlled companions for players who prefer to go questing on their own. And, of course, there are plenty of new quests to complete and dungeons waiting to be plundered.

resolution even on a basic M1 processor on our 24-inch iMac.

3. HORROR GAME
Resident Evil: Village

Price: £32.99 from fave.co/40IGb2T

The Resident Evil games are the sort of A-List titles that rarely come to the Mac, so the announcement at 2022's WWDC that Resident Evil: Village would be released on the Mac at the end of the year was big news for Mac gamers. The game doesn't disappoint either, providing a series of creepy locations for you to explore, and a variety of supernatural menaces to fight against.

Mac users, of course, will be new to the games, but Village starts off with a brief recap of the previous game to bring us up to date. Three years ago – in Resident Evil 7 – Ethan Winters and his wife, Mia, were trapped by the Baker family in Louisiana, who had been infected – and mutated – by a mysterious black mould. They managed to escape, assisted

by paramilitary operative Chris Redfield, and then three years pass by before things start to get weird all over again. Ethan and Mia are now living peacefully, along with their young daughter, Rose, until Redfield suddenly reappears, gunning Mia down in cold blood and kidnapping Rose. So, playing as Ethan, you now have to pick up the trail and try to figure out what is going on.

It's a frustrating game to get into at first, as the early stages of the game simply involve stumbling around a dark forest, liberally scattered with dead animals. Eventually, though, you discover the Village of the title, which is under siege by wolf-like Lycans, and find clues that suggest your daughter is being held in the conveniently creepy nearby castle. The pace

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barely lets up after that, with the game combining atmospheric horror and manic combat in equal measure (not to mention enough gore and bad language to merit a 17 age rating).

Apple used the game at WWDC to demonstrate the graphical performance of its new M2 chips – but the good news is that we found the game runs pretty well even on a 24-inch iMac with the older M1 chip. The bad news is that it doesn't run on Intel Macs at all, and you're paying extra for the Mac version, which costs £34.99 on the Mac App Store, while the Windows version – released in 2021 – is half that price on Steam. It's still a great game, though, and hopefully it's just the first of many A-List titles that we can look forward to on the Mac in the new couple of years.

4. SUBSCRIPTION MMO
World Of Warcraft: Dragonflight
Price: £39.99, plus £9.99/month subscription from fave.co/3TV1L27 World Of Warcraft has dominated the MMO genre for almost two decades now, and is one of the few A-list games to have staunchly supported the Mac throughout its history – in fact, it even provided an update that allowed the game to run on Apple Silicon Macs as early as November 2020. It's had a few ups and downs in recent years – both in the real-world and in the game's virtual world of Azeroth – but the release of the Dragonflight expansion at the end of 2022 was a welcome return to form, providing some important new features and also updating some of the more dated aspects of the game.

Dragonflight costs £39.99, and is required in order to enjoy new features such as raising your characters to the new maximum of Level 70. It also gives you access to the Dragon Isles, which contain four major new zones

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for you to explore and go adventuring. The Dragon Isles are also home to a new playable race of 'draconic humanoids' called Dracthyrs, who can play as the new Evoker class, which has the ability to choose between either healing or combat abilities.

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And, on entering the Dragon Isles, you can also obtain your own 'drake' – a flying dragon that allows you to learn a new set of 'dragonriding' skills that let you fly further, faster and higher as you explore the new zones. Throw in a more streamlined skill tree and a number of improvements to WoW's aging interface, and the entire game feels more sprightly than it has done for several years. You don't have to buy Dragonflight straight away though, as WoW still provides a free trial that takes you up to Level 20 for free, while owners of previous versions of the game can still continue to play – without the new Dragonflight features – by paying for a monthly subscription (£9.99 per month, with discounts for three-month or six-month subscriptions).

5. STRATEGY GAME
Total War: Warhammer III
Price: £49.99 from fave.co/3Khn4Yt

Perhaps the biggest game release of 2022 on the Mac, Total War: Warhammer III provided a truly epic conclusion to this popular series of strategy games. There's no need to worry if you haven't played any of the earlier games, though, as this three-quel includes an optional prologue, called The Lost God, that can act as an introduction for people who are new to the world of Warhammer.

This prologue explains that the great Beard God, Ursun, who is worshipped by the human kingdom of Kislev has been imprisoned in the demonic Realms Of Chaos. In Ursun's absence, a terrible winter has fallen over Kislev, so you start by playing Prince Barkov of Kislev,

who leads a small band of warriors to discover the fate of Ursun. This section also acts as a tutorial for people who might be new to strategy games, and when you're up to speed you can progress to the main campaign in which rival factions compete to reach Ursun and use his godly powers for their own ends.

As well the people of Kislev, you can command another human kingdom called Grand Cathay, or turn to the dark side by playing one of the many demonic princes who all have their own monstrous armies. There's Nurgle, the Plague Lord, whose somewhat squishy troops spread disease and decay, along with Khorne, the Blood God, the hedonistic Slaanesh, and Tzeentch, the master of Chaos Magic. And, finally, there's the uber Daemon Price, whose powers – and even body parts – can be customized so that you can create a playing style that's all your own. You can also buy additional DLC packs that add new factions and races to the game. There's also a free add-on called Immortal Empires,

which brings together campaign maps, factions and battles from all three Warhammer games into one vast and endlessly replayable series of battles.

The good news is that the game will run on any Mac with an M1 or M2 processor – and we found that it ran at a smooth 30- to 40fps at 1,920x1,080 resolution even on a 24-inch iMac with a standard M1 processor. But while Intel Macs with AMD graphics may be able to run the game, there are a few technical glitches that can affect these Macs, so the game isn't 'officially supported' on Intel Macs.

6. ACTION GAME
Alien: Isolation – The Collection
Price: £34.99 from fave.co/3dE8fOx

Most of the games based on the Alien films have been pretty awful –

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in fact, Alien: Colonial Marines even prompted a lawsuit back in 2013 from disgruntled customers who felt they'd been misled by the advertising for the game. Fortunately, as our friends over at GameAgent recently remarked, Alien: Isolation is one of the "good Alien games".

Originally released for the PC in 2015, Alien: Isolation has arrived on the Mac and does a great job of capturing the tension and atmosphere of that very first Alien film. The game is set 15 years after Alien, following the discovery of the black-box flight-recorder from Ellen Ripley's ship, The Nostromo. Ripley, of course, is still missing, so her daughter Amanda heads off to recover the black-box from the space station that found it.

No prizes for guessing what Amanda and her team discover when they arrive at the space station: a toothy xenomorph on the loose, and gradually working its way through the terrified crew. Your task as Amanda is not to go in with all guns blazing, but simply to avoid the

alien and stay alive – hiding inside a locker, or creating a distraction that will draw the alien away for a few crucial seconds.

The game creates a real sense of tension, and the computer-controlled alien is smart enough to provide a really formidable foe. This 'collection' also includes a number of bonus missions, including Crew Expendable, which re-enacts events from the original Alien film. However, the game's system requirements are pretty high, so you should check that your Mac is up to it before buying the game.

7. RPG
Baldur's Gate II
Price: £15.49 from fave.co/3oGeFCV
The original Baldur's Gate II was released way back in 1988 by the roleplaying gods at Bioware, and its

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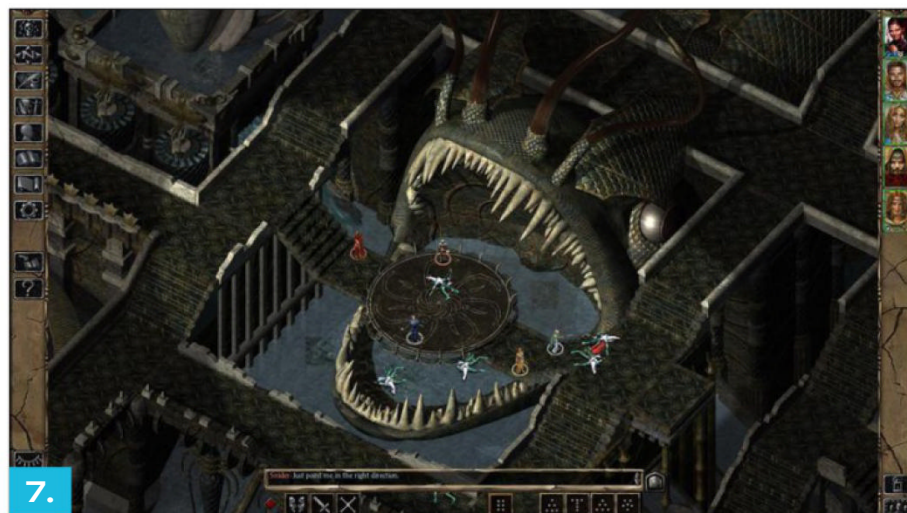
2D graphics will look pretty dated to anyone that has played modern roleplaying games such as Bioware's Dragon Age series. Even so, it's an essential purchase for anyone that has even the slightest interest in roleplaying games, and the sheer size of the game means that it's excellent value for money.

It's a shame that this updated Enhanced Edition couldn't be brought right up to date with more modern 3D graphics, but it does get a cosmetic makeover with high-def versions of the original artwork, so it doesn't look too bad on modern computer screens. Besides, whether in 2D or 3D, Bioware's great strength has always been its story-telling skill, and Baldur's Gate II is as captivating now as it was nearly 30 years ago. It's very much traditional fantasy fare – with you taking on the role of a warrior, wizard, rogue or cleric – but it's done on a truly grand scale. Your character is just one of many mortal offspring spawned by the evil god Bhaal, and the game pits you against several of your own brothers and sisters as they vie to succeed Bhaal and claim his power as their own.

There are hundreds and hundreds of quests along the way – around 300 hours worth if you try to complete them all – including power struggles within the guild of Shadow Thieves, and an epic battle with the wizard Irenicus, played in full scenery-chewing mode by Brit character actor David Warner. Throw in the return of bonkers barbarian Minsc and his giant space-hamster Boo, and BGII is a real retro treat for RPG fans.

8. PLATFORM GAME
Braid
Price: £10.99 from fave.co/3pDJveI

The first time you play Braid, you might be forgiven for thinking you've just bought a late 90s puzzle

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platformer. You jump and run like Mario, kill monsters by jumping on their heads and collect puzzle pieces. And then you're introduced to Braid's killer feature: you can turn back time.

As you progress, you realise that this is a crucial part of the game's mechanics. There are sections you can't complete without winding back the action. Add in some fiendishly designed levels, a lot of old-school gaming and a genuinely great soundtrack, and you realise why Braid won all those awards.

9. STRATEGY GAME
Civilization V: Brave New World
Price: £19.99 from fave.co/3IB664l
The Civilization strategy games' basic formula remains the same: you start with a bunch of cavemen and progress through history to create a civilisation that will rule the world. But the Civ series has long since passed the point where all you had to do was build up a big army. Civilization V beefed up the diplomacy elements and the Gods and Kings expansion pack added religion to the mix. Brave New World adds even more depth.

There are nine new civilisations, including Portugal, Morocco, Brazil and the Zulus, but the real substance in Brave New World lies in the new cultural and ideological systems. The 'Culture Victory', for instance, is a new way of conquering the world, whereby nations can place musicians, writers and artists in key buildings, such as the Globe Theatre in London.

There's combat aplenty if that's how you like your strategy games, but the political, religious and cultural elements that it adds to the mix create a game in which you really can develop an entire civilization, rather than just building up a big army.

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grip that Diablo III exerts, even if Blizzard could have been more ambitious in updating from Diablo II. If you have any interest at all in sword and sorcery action games this is simply irresistible.

10. ACTION RPG
Diablo 3
Price: £16.99 from fave.co/3dFIaPa

Twenty years after the events of the last game, a meteor strikes the much-troubled town of Tristram, opening up a gateway into the depths of the earth and paving the way for the return of the demon lord Diablo. As always, it's up to you to gird your loins and turn back the forces of darkness before they unleash untold nastiness upon the earth.

This time around you can choose from five different character classes – barbarian, demon hunter, monk, witch doctor and wizard – each with its own unique skills and abilities. The graphics have been updated too, and now provide a true 3D view of the action.

There's no denying the addictive

11. DETECTIVE RPG
Disco Elysium – The Final Cut
Price: £34.99 from fave.co/3M1c5Uo

It's tough being a Mac gamer sometimes, watching great new games always arriving first on PC – and often never being released on the Mac at all. Last year's launch of Disco Elysium was particularly galling for RPG fans, as we watched the PC version of the game mop up awards all over the place. However, the Mac version of Disco Elysium has suddenly appeared, with no advance publicity, and is widely available on all the main online game stores.

As mentioned, Disco Elysium is an RPG, but instead of medieval fantasy or futuristic sci-fi, the game casts you in the role of a drunken detective in a sort-of-contemporary setting, in the town of Revachol.

You wake one morning in a sleazy hotel, with a mega-hangover, barely knowing who you are. After locating your trousers, you explore the hotel and encounter your partner, who reminds you that you are a detective investigating a murder case. You then set off to explore the local neighbourhood, interrogating suspects and looking for clues as you try to crack the case.

Despite the contemporary setting many traditional roleplaying features are still in evidence – you can choose an 'archetype' for your character, such as the 'Thinker' who relies on deductive skills, or take the 'Physical' approach and try to intimidate suspects for information. There's also an extensive set of additional skills, such as empathy or logic, that you can use to help you in your investigation. You don't need to get too bogged down in stats and details, though, and you'll soon be able to head off and explore the neighbourhood, which is wonderfully depicted, with grimy graphics and atmospheric music.

Disco Elysium is the sort of absorbing, immersive game that can absorb you for hours on end. However, the system requirements for the 3D graphics are quite steep, so check to make sure your Mac can handle it first. Some of the language is a bit ripe too, so this definitely isn't a game for younger children.
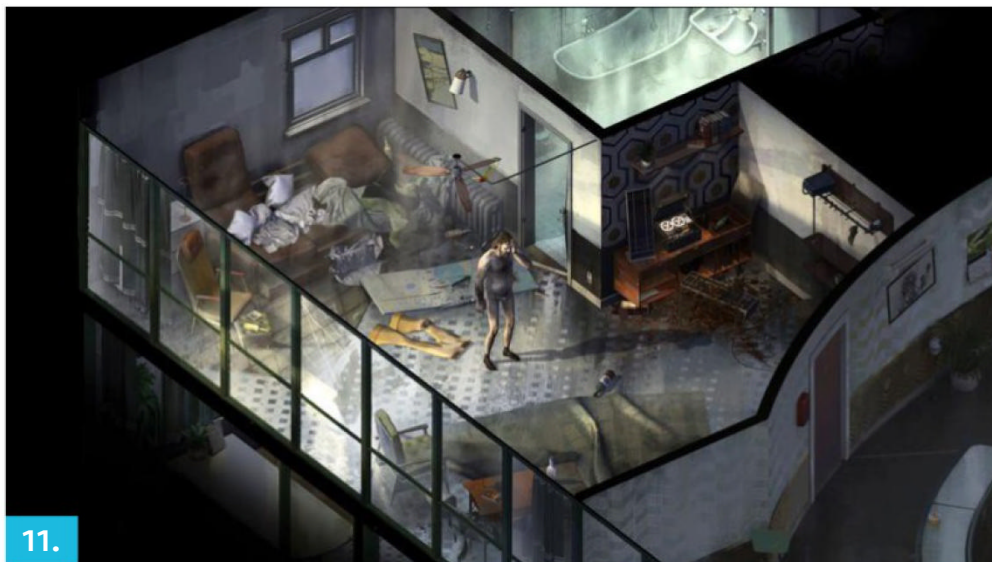
12. MULTIPLAYER RPG
Divinity: Original Sin 2
Price: £29.99 from fave.co/3Zp4phx

At the end of 2018, the developers at Larian Studios announced that they were working with Apple – in itself a bit of a shock as Apple generally shows bugger-all interest in games on the Mac – to develop a Mac version of Original Sin 2 (one of the

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greatest RPGs of all time) using Apple's Metal graphics system. There's nothing half-hearted about the Mac version, either – as well as using Metal for the impressive 3D graphics, the game supports

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HDR (high dynamic range) on the latest Macs, as well as Mac-specific features such as Apple trackpads and the TouchBar on new MacBook Pro models. And the game's multiplayer mode even works across both Macs and PCs, so you can play online with your friends (as long as you've all got the latest patches and updates). The only drawback here is that the Metal graphics require a fairly powerful Mac, so make sure to check the game's system requirements before buying.

Don't worry if you've haven't played the original game, as this sequel remains in the fantasy world of Rivellon, but steps forward in time and allows you to embark on an entirely new adventure. You start the game in a bit of trouble, as you've been captured and sentenced to jail

for using a dangerous magical force called 'Source'. Using Source gives you – and other 'Sourcerors' – great power, but it also creates a gateway to another dimension called The Void, allowing evil creatures to invade Rivellon. And, yep – you guessed it – your job is to save the world from the invading demons.

The game begins with a helpful tutorial to get new players started, and newcomers can also opt for a ready-made 'origin' character that has already been set up for you. More experienced players can delve into character creation, with a wide variety of races on offer – with standard options such as humans, dwarves and elves complemented by more exotic lizards and undead – and the game also offers several difficulty levels and modes to cater

for different playing styles and levels of experience.

It might all sound like fairly routine fantasy fare, but Original Sin 2 is tremendously well-made and involving. There are few simple good-versus-evil

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choices, and sometimes you'll find yourself racked with guilt because you simply can't find a nice, clean solution to a particular problem or a tricky side-quest. The solo game by itself will keep even hardened roleplaying fans absorbed through the dark winter months, and the various online and multiplayer modes will ensure that Divinity: Original Sin 2 is a game that you'll come back to time and time again.

13. MMORPG
Elder Scrolls Online: Blackwood

Price: £8.99 per month subscription from fave.co/3FXiwnu

The Elder Scrolls Online is one of the few A-list MMORPG titles that supports the Mac, and ever since its launch back in 2014 the

developers at Zenimax have kept their loyal players coming back by updating the game with a regular series of new 'chapters'. These are essentially expansion packs that add more content, and occasionally new features too. But every year or so, Zenimax releases an update that makes major changes to the game in order to keep it feeling fresh and exciting – and 2021's Blackwood expansion is one of the biggest updates for quite some time.

The changes begin as soon as you enter the game. Even if you haven't bought the Blackwood expansion there's a new introductory tutorial that sends you to the island of Balfiera, where you can learn the ropes by helping the local townsfolk to fend off an invading army of monsters. Once you've completed

the tutorial you're given the option of entering a portal that can send you anywhere in the vast world of ESO.

If you decide to head off to Blackwood, you'll discover a vast new zone, full of quests and challenging dungeons. Blackwood also introduces a new companion system, which allows solo players to recruit a computer-controlled companion who can fight alongside you. This will be great for players – like me – who tend to play solo most of the time, with the new companion helping you to complete quests and tasks that might previously have been a bit too tough for one player on their own.

Blackwood also introduces a new Gates of Oblivion storyline that will continue developing throughout this year, with a major quest that pits you against the demonic Prince Of Destruction, as he schemes to invade the mortal realm. The good news is that you don't have to pay the full price for Blackwood right away, as

the original base game now costs just £14.99/$19.99 – and no longer requires a monthly subscription to play. That contains enough action and adventure to keep you happy for months, before you decide if you want to visit Blackwood as well.

14. MMORPG
Final Fantasy XIV Online
Price: €39.99 (around £35) from fave.co/3MOPMhl

As we've mentioned in the past, Final Fantasy XIV has had a bit of a chequered history – with the original Mac version in 2015 being so bad that the developers actually offered refunds. However, a series of updates over the past few years have seen FFXIV emerge as one of the top games in the MMORPG genre – despite the fact that, until recently,

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it was one of the few MMORPGs that still required a subscription to play.

The latest update, which is now called Final Fantasy XIV Online, gives the game another major revamp, reworking the central quest system in order to give players a smoother introduction to the game's vast online world. It also incorporates the Heavensward expansion pack that was previously sold separately, giving you even more quests and adventures to explore. Most important, though, is the new free trial system, which allows new players to sign up for a free account that provides access to vast areas of the game without paying for a subscription (although, to be honest, the registration process is a bit of a chore).

Players with a trial account can take their characters all the way to level 60 – the maximum level with a subscription is 80 – and explore the main game and all the extra zones and quests in

Heavensward for free. If you want to advance beyond L60 and explore new character classes and other new features then you will still need to buy a copy of the game and pay for a continuing subscription. However, you can start for as little as £9.99 for the Online Starter Edition, and then decide if you want to continue your subscription, and buy the latest Shadowbringer expansion pack as well.

15. SPORTS GAME
Football Manager 2023
Price: £44.99 from fave.co/42S2VPM

Who'd want to be a football manager these days, when billionaire owners can hire and fire at the drop of a hat? Fortunately, the Football Manager series doesn't worry too much about that, and this year's update very

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much concentrates on putting armchair managers even more firmly in control of their teams than in previous years.

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The data hub provides in-depth analysis of your team's performance throughout each match. A series of Key Findings provides a quick summary and key data such as successful passes and long shots, but if you're a real data hound you can drill right down and view graphs that illustrate both team and individual performance.

You have communication with your support team too, via a weekly Staff Meeting. This includes reports from your assistant manager, scouts and coaching staff. Your staff can also make suggestions, which you can accept, or delay, or even pass over to the rest of the staff to ask for a second opinion.

The animation engine closely follows the physical 'skeleton' of the players on screen, creating the appearance of smoother movement. Even the ball itself benefits from a 'dribbling system' – which produces accurate and realistic movements as players try to change the direction of the ball when passing. As well as improving the appearance of the graphics, this opens up new tactical possibilities, allowing the game to now accurately depict a wider range of dribbling movements, such as the famous Cruyff Turn, for the first time.

16. CARD GAME
Hearthstone
Price: Free (in-app purchases) from fave.co/40CQwh6

Hearthstone has been around for a few years now, and Blizzard's typically slick presentation quickly established it as one of the leading computer card games. Like most card games, the basic version of Hearthstone is free to play, but offers a wide range of card packs that you

can either buy with real money – starting from £2.99 for two packs of five cards – or earn by collecting gold and treasure within the game itself.

Picking up a trick from the long-running success of World Of Warcraft, Blizzard also releases special 'expansion packs' for Hearthstone every now and then, which bring new features to the game, as well as new cards and other goodies.

But Hearthstone is still a fun game to play, even if you don't want to spend a lot of money buying all the latest expansions. It's a good option for newcomers to card games, with a simple tutorial that guides you through the main features of the game, and the basic/free version of Hearthstone still includes several different game modes that you can play in order to win new cards without spending any money at all. The game runs on most types of computer and mobile devices too, so you can switch between

Mac, iOS and other devices using the same game account.

17. LEGO GAME
Lego Star Wars: The Complete Saga
Price: £15.49 from fave.co/3JUf7XU

No home should be without at least one Lego game, and if you pick up the Saga version you get the six games based on the Star Wars films for an affordable price.

The sheer fun of playing with the Lego versions of Luke, Han, Yoda and Darth Vader will appeal to both adults and children. The six games in this pack offer a variety of different scenarios, including space battles, lightsaber duels, and the famous battle on the ice planet of Hoth. If you're a *Star Wars* fan, Feral has also

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released a new Lego game based on the *Clone Wars* cartoon series, and there are other Lego games based on the Batman, Harry Potter and Indiana Jones films as well.

18. ADVENTURE GAME
Life Is Strange

Price: £15.99 from fave.co/3GzWWTN

At first glance, Life Is Strange looks like a fairly conventional adventure game. You play a teenage girl called Max Caulfield who is having a bit of a bad day at school. Max ducks out of class and heads to the bathroom for a time-out, and as you wander the school corridors you can click on objects or people around you to gather information that guides you through the game. That's routine adventure stuff, but life starts to get strange when Max witnesses the murder of her friend Chloe – and discovers that she has the ability to turn back time.

Saving Chloe reveals a deeper mystery concerning a missing student called Rachel,

so Max and Chloe set off to find Rachel and uncover the dark secrets of the sleepy town of Arcadia. That's straightforward enough, but Chloe's time-travelling abilities add a whole new dimension to the standard point-and-click adventure format. Sometimes a conversation with another character will reveal some useful information, allowing Chloe to go back and replay recent events so they have a different outcome. However, changing past events can have unexpected consequences, leading to some difficult – and dangerous – decisions.

The story unfolds in five separate episodes, but you can check it out for free by downloading the first episode through Steam and then deciding if you want to explore the mystery further. We enjoyed its haunting,

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Buffy-esque depiction of the dark side of teenage life, and our only complaint is that the keyboard-and-mouse controls felt a bit clumsy so you'll progress more smoothly if you have a proper game controller to help you out.

19. PUZZLE GAME
Papers, Please

Price: £6.99 from fave.co/42SA51O
Almost unclassifiable in normal gaming terms – we've put it with the puzzlers, although it's really a bizarre take on the classic worker simulation – Papers, Please sees you taking up the post of border control in an authoritarian regime. Which is certainly a novel idea for a game.

People enter your booth and present their papers; it's your job to figure out if they can be allowed in. If you spot an irregularity in their paperwork, deny them entry. If their sob story touches your heartstrings, let them in. But if you let through too many dodgy types, or work too slowly, the money you earn will take a dip, and your family need to eat.

Papers, Please is a quirky, interesting game set in a truly novel (and utterly bleak) environment. And while the level of profundity is debatable, there's definitely more going on here than in your average worker sim.
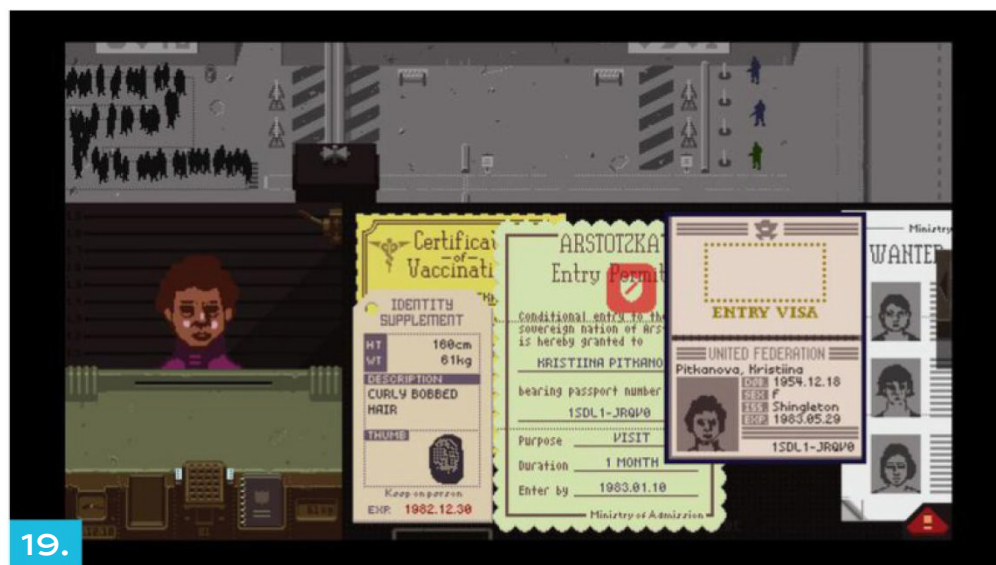
20. SIMS GAME
The Sims 4

Price: £34.99 from fave.co/3lRjFXO
There's a lot to take in with the latest addition to The Sims line-up: deeper customisation, more variety with actions, new careers and new places to explore. The Sims 4 had a lot to live up to after the success of The Sims 3, but it fills its predecessor's shoes beautifully.

You get a deeper level of character

19.

customisation than in previous generations. While you can still browse and select preset eyes, mouth, hair, and so on, The Sims 4 allows you to fine-tune your character's looks and build by clicking and

20.

dragging the area you want to tweak. Does your Sim's belly protrude a little too much for your liking? Clicking on the troubled area and dragging it in will make your Sim thinner – it's as easy as that.

The build and design mode in The Sims was the basis for the game as a whole – it started off as a simulator that architects could use. And it's fantastic here. It's a great experience being able to design a home exactly how you want it to be and really gets your creative juices flowing. With more design options (like the ability to build "in the air" with no support below), houses in The Sims 4 looks more breathtaking than ever. You can pick up and move whole rooms whenever you fancy a change, and buy whole rooms of same-style furniture. For those of us without an

eye for interior design, it allows us to really appreciate the game and the design process.

Day-to-day life in The Sims 4 is more enjoyable, too. If your Sim is hungry, simply click on the hunger bar and the Sim will automatically feed themselves – the same applies to all their other needs too. It takes the effort out of the more mundane tasks and allows you more time to do the fun things with your Sim.

The Sims 4 is a great game with so many options that you'll lose yourself for hours at a time.

21. RPG
Star Wars: Knights of the Old Republic II
Price: £7.19 from fave.co/4OHKAmM
It's more than a decade since the original Knights Of The Old Republic

was first released, but that game is still selling well on the App Store even after all these years. So it came as a bit of a surprise when we realised that this sequel – originally released for PC back in 2005 – has only just arrived on the Mac for the first time.

21.

Like its predecessor, KOTOR II is set thousands of years in the past, long before the events of the Star Wars film series. You play one of the last surviving Jedi, who have been almost completely wiped out after a long war with the evil Sith Lords. At the start of the game you wake up injured and with no memory of recent events. Even your trusty light-sabre has gone missing, so your initial challenge is to recover your memory and your Jedi powers, and then set off to try and find any other Jedi that may have survived.

There's a wide range of skills and abilities that you can develop as you progress through the game,

and you can focus on either light-sabre combat or spooky Force Powers depending on how you want to develop your character. There's also a strong story and roleplaying element, full of political twists and turns, and moral decisions that will affect the final outcome of the game. The 3D graphics look a little dated now, but the intriguing storyline and light-sabre action will soon have you hooked, and at just £7.19 the game's a real bargain for Star Wars fans.

22. STRATEGY GAME
Total War: Warhammer II
Price: £39.99 from fave.co/3lUbB7R
Total War: Warhammer was a match made in Orc-heaven, as it combined the fantasy warfare of

the Warhammer series with the large-scale battles of the Total War strategy games. So it's no surprise that this follow-up offers more of the same, albeit with enough variety to make it worth coughing up the rather hefty £39.99 on Steam. But you should check the game's system requirements first, as the battling armies of elves, lizardmen and rodent-like Skaven need a pretty powerful Mac to handle their demanding 3D graphics.

The story for the main single-player campaign is, to be honest, fairly trite fantasy fodder, with the game's four rival factions competing to control a great, swirling vortex of magical energy floating up in the sky. That's little more than an excuse to get the rival armies and heroes charging across the game's vast landscapes, but the main campaign

is well constructed and gives you plenty of different options for getting stuck into endless hours of fantasy fisticuffs. You can control any of the four rival races, and each race lets you choose between two Legendary Lords, who all have different storylines and starting locations, as well as their own special abilities that can be used to assist their troops in battle (and, if you're new to the Total War games, one Lord for each race also gives you a handy tutorial to get started). That gives you eight different options for playing and re-playing the game, and if you also own the original Total War: Warhammer then you get a free bonus campaign thrown in as well.

The game also includes a number of Battle modes that you can dip into for a quick fix every now and then, as well as a multiplayer mode.

22.

23. RPG
WIldermyth
Price: £19.49 from fave.co/3nwRsoV
Wildermyth is an unusual and impressive roleplaying game with flexible character development that

encourages you to go back and play through it again.

It's an immediately eye-catching game with 'papercraft' graphics that look like a child's popup book, as your 2D characters use a turn-based combat system to move through hand-painted 3D environments. You start by creating a party with three characters: a warrior, a hunter (rogue) and mystic. These characters are created by the game, with their own personalities and backgrounds, although you can fine-tune each character by modifying their appearance, skills and other abilities.

And, like all good roleplaying games, it allows you to make choices that affect the story and the relationships between the various characters. At various points you'll be presented with options – drawn like panels from a comic book rather than dull lumps of text – that establish whether your characters are friends, rivals, or even in a romance, and this affects the way that the story develops and how the lives of your characters unfold.

The tutorial could be a little clearer – I had to look up some videos on YouTube to help me get started – but the turn-based combat isn't too difficult to master, and you can develop your party's abilities to combine stealth, magic and weapon skills in any way that you like. And, at the end of each game, you can save favourite 'legacy' characters in order to bring them back the next time you play.

This is where Wildermyth really stands out, as its story is 'procedurally generated' – it's not entirely random, but is flexible within a framework that is controlled by the game itself. There's enough variety within that framework to enjoy playing through again, and gives you

23.

24.

explore. The fairly regular release of new material keeps experienced players happy, but to attract new players, Blizzard announced a Starter Edition of the game that allows you to play for free until your character reaches level 20.

the luxury of being reunited with your favourite characters to see how their stories and relationships continue to develop throughout their lives.

24. MMORPG
World of Warcraft

Price: £9.99 per month from fave.co/3KfAILK

Its cutesy graphics aren't to everyone's taste, but World of Warcraft is still the game that rules the massively multiplayer online scene, with around seven million subscribers playing as wizards, priests, warriors and rogues. Part of that success is down to the release of regular expansion packs, such as 2010's Cataclysm, which – quite literally – shook up the landscape, destroying some old areas and introducing new zones for you to

25. STRATEGY GAME
XCOM 2

Price: £34.99 from fave.co/3TRHzxW

The good news is that XCOM 2 arrived on the Mac at the same time as the PC version. The bad news is that the aliens won at the end of XCOM: Enemy Unknown back in 2013. So now we jump forward 20 years and the Earth is ruled by Advent – a coalition of alien overlords and their human collaborators – so it's up to you to lead the human resistance movement and recruit a new XCOM team to wage a guerrilla war against the alien oppressors.

Like its predecessor, XCOM 2 is a turn-based strategy game that provides an overhead isometric view of the battlefield so that you can plan

25.

available too. Your base is a captured alien ship called the Avenger, and between missions you need to give careful thought to developing the engineering, research and armoury facilities on the ship in order to provide new weapons and technology for your team. It's gripping stuff, and guaranteed to keep strategy fans glued to the screen for hours on end.

your team's moves as they approach their target. But the moment you pull the trigger the action switches to a close-up view – similar to a first person shooter – that gives it a more visceral feel than most conventional strategy games.

There are five soldier classes available to help you out, including Sharpshooters with their long-range sniper skills, and Grenadiers who just charge in and blow up everything in sight. There's also the Psi Operative, who adds a fantasy/sci-fi element with telepathic abilities such as Soulfire and mind-control. Each class also gets its own selection of different skills, giving you plenty of freedom to develop your team in a way that suits your combat style.

There are other resources

Review: iPhone 14 Plus (Yellow)

Price: £949 from fave.co/40F0QoB ★★★★☆

It has been almost half a year since the release of the iPhone 14 Plus, and since Apple is refreshing the iPhone 14 and 14 Plus with a new yellow colour, and we didn't test and review the iPhone 14 Plus upon release, this felt like a good time to check in on it.

In general, what applies to the iPhone 14 applies to the 14 Plus. It's the same phone, only larger. The larger battery makes it last longer, but it is otherwise just a choice about the phone/display size that's best for you.

This is a good phone and a decent upgrade (especially if you're coming from a model at least two or three years old), but it's sort of hard to recommend. Starting at £949, it's £150 short of the regular-sized iPhone

14 Pro. The Pro models always offer more, but this year the gap is wider than ever as the Pro models have a newer processor in the A16, a brighter display with an always-on feature, Dynamic Island, telephoto camera, and 48Mp main camera.

Apple's pricing and product differentiation strategy puts the iPhone 14 Plus in a tough spot, where it is far too expensive to be the 'affordable big phone' choice, and too limited relative to the iPhone 14 Pro to justify its high price.

DESIGN

The new yellow colour is not for everyone. My wife saw my test phone on my desk and said "you got a yellow iPhone case?"

"No, it's a yellow iPhone. I'm testing it," I said.

"It's awful. Why did they make this?" she replied, turning it over in her hands.

Some will love it, some will hate it. It's yellow. It is hard to describe it another way because that's what it is. Close your eyes and picture 'yellow'. You nailed it! When Crayola makes a crayon that is yellow – not 'sunglow' or 'canary' or 'laser lemon' – it's this colour. It's not 'yellow but with a hint of'. It is 'no-modifier'

yellow. Thankfully it's just one option you have among five other colours: midnight, starlight, blue, purple and red. It is otherwise very much a modern iPhone. There's a notch where the front camera and Face ID stuff goes (rather than the pill-shaped Dynamic Island of the Pro models), a rounded-circle camera bump on the back with two cameras (12Mp wide and 12Mp ultra-wide), buttons on the side, and lightning port on the bottom. The 6.7-inch display makes it pretty large, and small phone fans are definitely upset that the iPhone 13 mini was replaced by this bigger, more expensive, model.

BATTERY LIFE

There's little reason to dive deeply into the specific features and performance of the iPhone 14 Plus, other than to confirm that, yes, it is exactly like the iPhone 14. If you're curious about camera quality, performance, display quality, and all those other specifics refer to our iPhone 14 review. The iPhone 14 Plus is identical – or close enough not to matter.

With one exception: battery life. With a larger battery and display, one can reasonably expect the iPhone 14 Plus to have different battery life than

The new yellow colour isn't for everyone.

the smaller model. Apple says it has the longest battery life of any iPhone, including the iPhone 14 Pro Max.

In our testing, that didn't quite pan out. The iPhone 14 Plus is the second-longest-lasting iPhone, behind the iPhone 14 Pro Max, more or less tied with the iPhone 13 Pro Max. When you consider that the iPhone 13 Pro Max has a similar display and A15 processor, that makes a lot of sense.

Battery life

iPhone 14 Plus: 696 minutes
iPhone 14 Pro Max: 760 minutes
iPhone 14 Pro: 584 minutes
iPhone 14: 537 minutes
iPhone 13 Pro Max: 701 minutes
iPhone 12 Pro Max: 521 minutes
iPhone 11 Pro Max: 427 minutes

Note that we test with a different methodology than Apple does. We use the Geekbench 4 battery test, which continuously runs that (now aging) benchmark with the display on. We set the display to a measured brightness of 200 nits. Apple uses a different brightness setting and measures standby, video playback, audio playback, and phone call duration. Our tests tend to put a lot more stress on the CPU and GPU than Apple's.

The iPhone 14 Plus is not, in our testing, the longest-lasting iPhone available, but it still provides really excellent battery life. It's impressive how battery life in Apple's largest phones has grown by over 60 percent in just a few years, even while vastly improving performance and display quality.

VERDICT

There's no doubt that the iPhone 14 Plus is a good phone. It's got fantastic performance, battery life, and an excellent camera. But is it £949 good? That's a little less clear.

It certainly stings that this model replaces the iPhone 13 mini, which not only swaps the only small phone in Apple's line-up for a larger one but replaces a £679 phone with an £949 one.

Perhaps more important, though, is that the iPhone 14 Pro can be had for just £150 more, and it gives you quite a lot: the more powerful A16 chip, always-on display, higher maximum brightness, Dynamic Island, telephoto camera, and 48Mp wide camera. The non-Pro iPhone 14 models aren't a big leap over the iPhone 13, frankly, while the iPhone 14 Pro is.

If you can spend £949 on this, you can spend £1,099 on the Pro. Even £1,199 on the iPhone 14 Pro Max is probably a better idea if you really need a bigger iPhone. If you plan to keep your iPhone for at least a couple of years (and you probably should), you'll appreciate all the things the Pro and Pro Max models give you for a relatively small investment. **Jason Cross**

SPECIFICATIONS

- 6.7in (2,778x1,284; 458ppi) Super Retina XDR OLED, HDR10 display
- iOS 16
- Apple A15 Bionic (5nm) processor
- Hexa-core (2x 3.23GHz Avalanche, 4x 1.82GHz Blizzard) CPU
- Apple (5-core graphics) GPU
- 4GB RAM
- 128GB/256GB/512GB storage
- Two rear-facing cameras: 12Mp, f/1.5, 26mm (wide), 1.9μm, dual pixel PDAF, sensor-shift OIS; 12Mp, f/2.4, 13mm, 120-degree (ultra-wide)
- Two selfie cameras: 12Mp, f/1.9, 23mm (wide), 1/3.6in, PDAF; SL 3D, (depth/biometrics sensor)
- Wi-Fi 802.11 a/b/g/n/ac/6, dual-band, hotspot
- Bluetooth 5.3, A2DP, LE
- GPS with A-GPS, GLONASS, GALILEO, BDS, QZSS
- NFC
- Lightning, USB 2.0
- Face ID
- Non-removable lithium-ion battery
- 160.8x78.1x7.8mm
- 203g

Opinion: When I look at the yellow iPhone 14, all I see is red

The yellow iPhone is a trick – don't fall for it. **David Price** reports

Video games have changed in lots of positive ways since I was keen on them in the 1990s, from improved graphics to a broader outlook that caters, with only a small amount of acrimony, to hardcore and casual gamers alike. But one thing that's got indisputably worse is the growing dominance of downloadable content (DLC) culture, where studios shamelessly launch

half-finished games and then milk their most loyal fans with years of subscriptions and paid-for extras. It makes me nostalgic for the days when you only had to pay once for an eternal masterpiece like Cannon Fodder or Sensible World of Soccer.

Why are you thinking about DLC, David? Because Apple has repeated its annual trick of launching a new colour midway through an iPhone generation, wowing fans with the excitement of a yellow enclosure. I feel about delayed colour launches much the same way I feel about DLC. I don't approve.

'Yellow' is not a brilliant new invention that Apple has had its engineers working on for the past six months. The company could very easily have released the yellow iPhone 14 alongside the other colour finishes last fall, but it decided not to for one simple reason: launching a new colour is a clever way to gain attention and boost a product just as sales are falling off. It's a cynical way to grab a few headlines and flog a few extra units.

Where does the customer figure in all this, other than as a source of revenue? Barely at all. Apple

The iPhone 14 Yellow is Apple's latest colour update.

isn't trying to deliver the best experience to the most people, but to hamper their choice in a way that is calculated to generate the maximum profit.

If you were buying an iPhone 14 last September and especially like the colour yellow, you faced a choice between two compromises: either buy a phone in a colour you don't like as much, or wait, hope Apple benevolently picks yellow as its bonus colour this cycle, and then end up buying your new phone at a time that's less convenient. The same choice faced green-loving

iPhone 13 buyers in 2022, and pro-purple iPhone 12 customers in 2021; compromise on colour, or compromise on timing. And the same could apply to those loyal early adopters who bought the second-gen HomePod earlier this year but – as was the case with the HomePod mini – may gaze longingly on the additional colour options that launch midway through the product's lifespan. It's all deeply frustrating and the polar opposite of putting the customer first.

But this policy, of deliberately holding back appealing elements of a product so you can sell the upgrade further down the line, ties in with a broader strategy of which Apple is often suspected. Why did Apple take so long to bring a large screen to the iPhone, or a stylus to the iPad? Why did widgets and night mode land so much later on iOS than they did on Android? Maybe it's because the company knew it could sell its devices without those features in the short term, and that they would be useful later on when it needed to persuade customers to buy the next generation. Each Apple product is competing with its own predecessor just as much as with contemporary products from rival manufacturers,

and this means the company is motivated to leak out useful features as slowly as possible: release the perfect iPhone tomorrow and you've just killed the goose that lays the golden eggs.

I don't expect Apple to change its ways any more than I expect video game publishers to stop selling DLC. There's too much of a financial incentive; the market has spoken. Unless people stop throwing their money at the latest iPhone colour, Apple isn't going to stop holding back colours so it can release them with fanfare a few months later.

But it does make me frown each spring when a new iPhone colour appears and we're all supposed to be pleased. What use is this now, Tim Apple? What am I supposed to do with this stupid blue phone I've been carrying around for six months? Do you think I'm made of money.

10 essential Mac trackpad gestures you need to know

Take steps toward being more efficient with your trackpad. **Tamara Palmer** reports

Apple has created 15 known gestures for your fingers to use on a Multi-Touch trackpad in order to perform a function. At least a couple of them are undoubtedly already second nature in your daily use, but you may not have had a chance to learn others that might really help you out over time.

If you can remember the following 10 gestures, you'll take steps toward being more efficient with your trackpad use while reducing strain on your hands. Even if it takes a moment to remember them all, there's one additional benefit beyond saving time by using gestures. There should also be a reduction in the frequency that an annoying

1.

2.
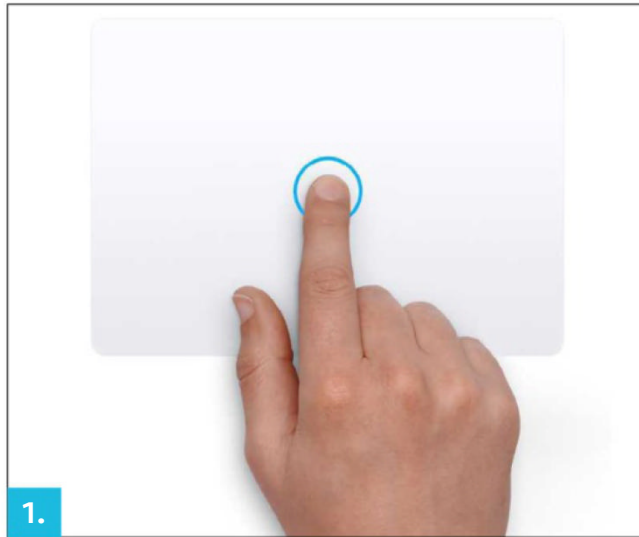
and task-disrupting gesture is used accidentally on the trackpad.

1. TAP TO CLICK

Tapping with one finger to click is a logical starting point for teaching someone how to use a trackpad. This most essential gesture allows the user to click on linked text and photos on websites and on a selected part of a document in a word processor. Without it, you're literally going nowhere. If you double tap, you'll perform what is probably the most frequently used gesture: open a file, folder, or app.

2. SECONDARY CLICK (RIGHT CLICK)

With the two crucial ones already clinched, these next gestures will only enhance your arsenal. Instead

of pressing Control and tapping with one finger to right-click, you can click or tap with two fingers to achieve the same result. The Secondary click can reduce strain on your purlicue, the area of the hand between the thumb and forefinger.

3. SCROLL

The next key gesture that all trackpad users know and use as often as

3.

4.

5.
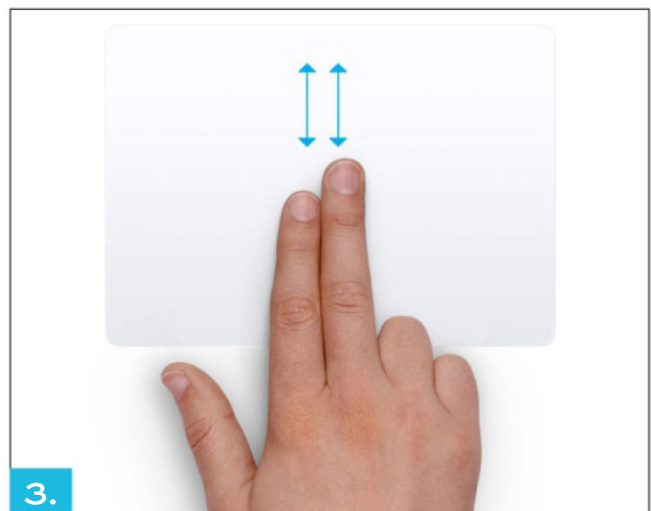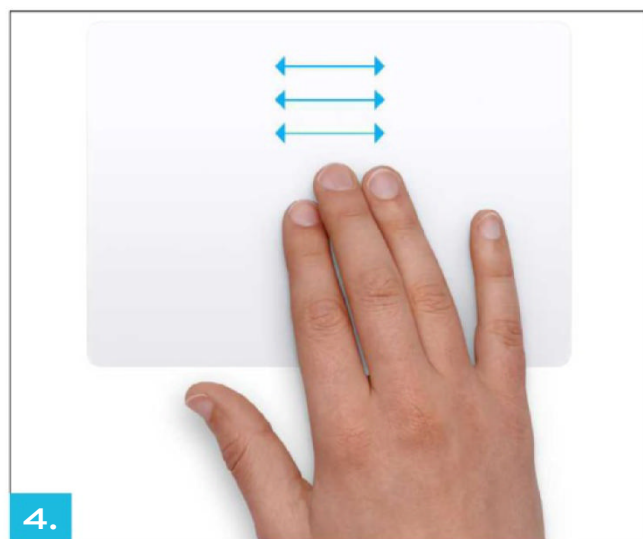
breathing is when two fingers (typically the forefinger and middle finger) slide up or down to scroll websites and documents. The slider bar that's usually found on the right edge of a website, word processing page, or Finder window is still handy when there are a lot of pages that you want to quickly jump past, but this gesture will be more useful for the finer points.

4. THREE-FINGER DRAG

Unlike the other gestures, you'll need to go to Accessibility preferences in System Settings to turn on three-finger drag. For a more ergonomic movement than what you may be used to making with your thumb and forefinger, you can use three fingers followed by a tap or click in order to drag and drop items on your screen.
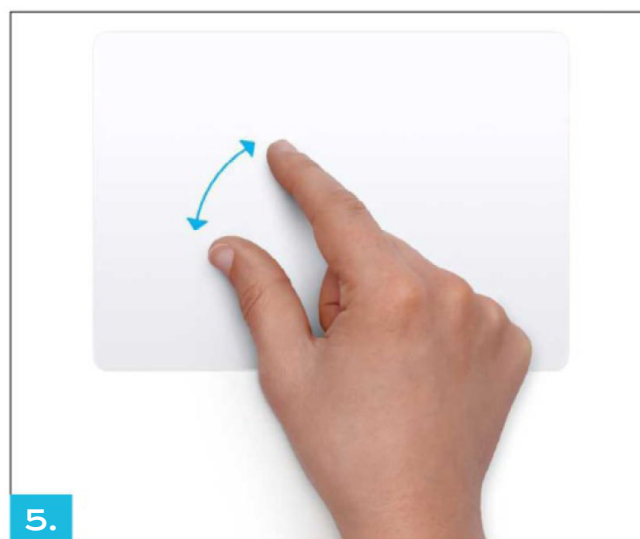
5. ZOOM IN OR OUT

It takes two fingers to either pinch and zoom into or stretch to zoom out of text or an image. Just be careful not to accidentally zoom out so far that you see all of your tabs divided into small, separate windows – depending on your tab habits, that might be jolting.


6.

7.

8.
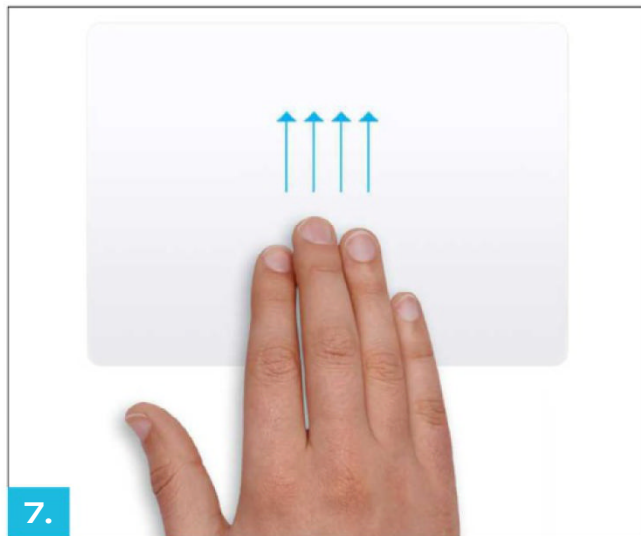
6. SMART ZOOM

Another dual finger gesture that can help you see better is smart zoom. Tap with two digits to quickly zoom into and then back out of a page or image. This differs from the aforementioned Zoom in or out gesture because there is only one degree of zooming available.

7. MISSION CONTROL

When you're ready for the overview of everything you have open and running, you can access Mission Control by swiping up with four fingers.

8. ROTATE

Speaking of images, you can also move two fingers around each other in order to rotate photos. This is useful for situations where the
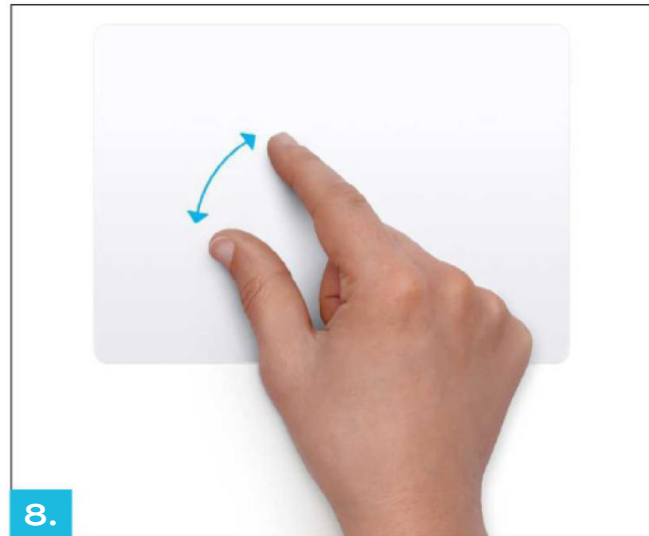
visual might be more interesting if presented with a different orientation. It might take a little bit of practice for doing rotations in fine increments.

9. LAUNCHPAD

Visually browse your collection of apps with Launchpad, which is accessed by pinching your thumb and


9.
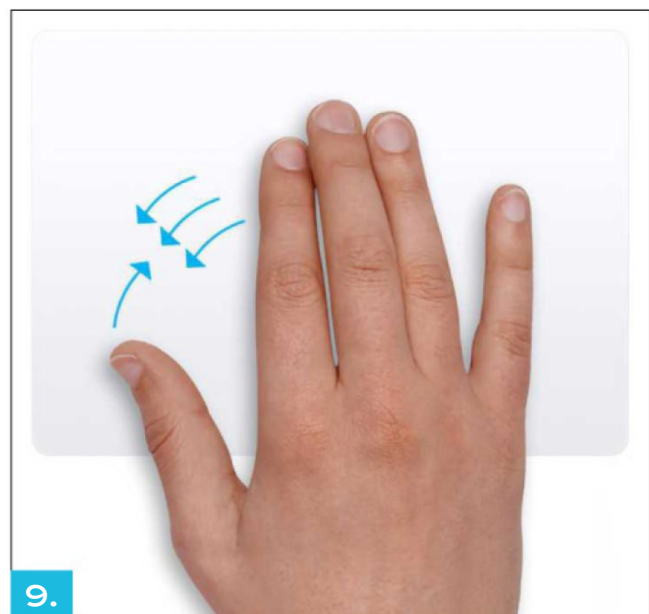
three fingers together. It's especially handy when you want to clear some out to make space for new ones.

10. SHOW DESKTOP

Move your thumb and three fingers apart to show the desktop, which can easily get cluttered and distracting if you don't glance at it once in a while. This and the opposite Launchpad gesture can both help you with the good housekeeping of your Mac's user interface.
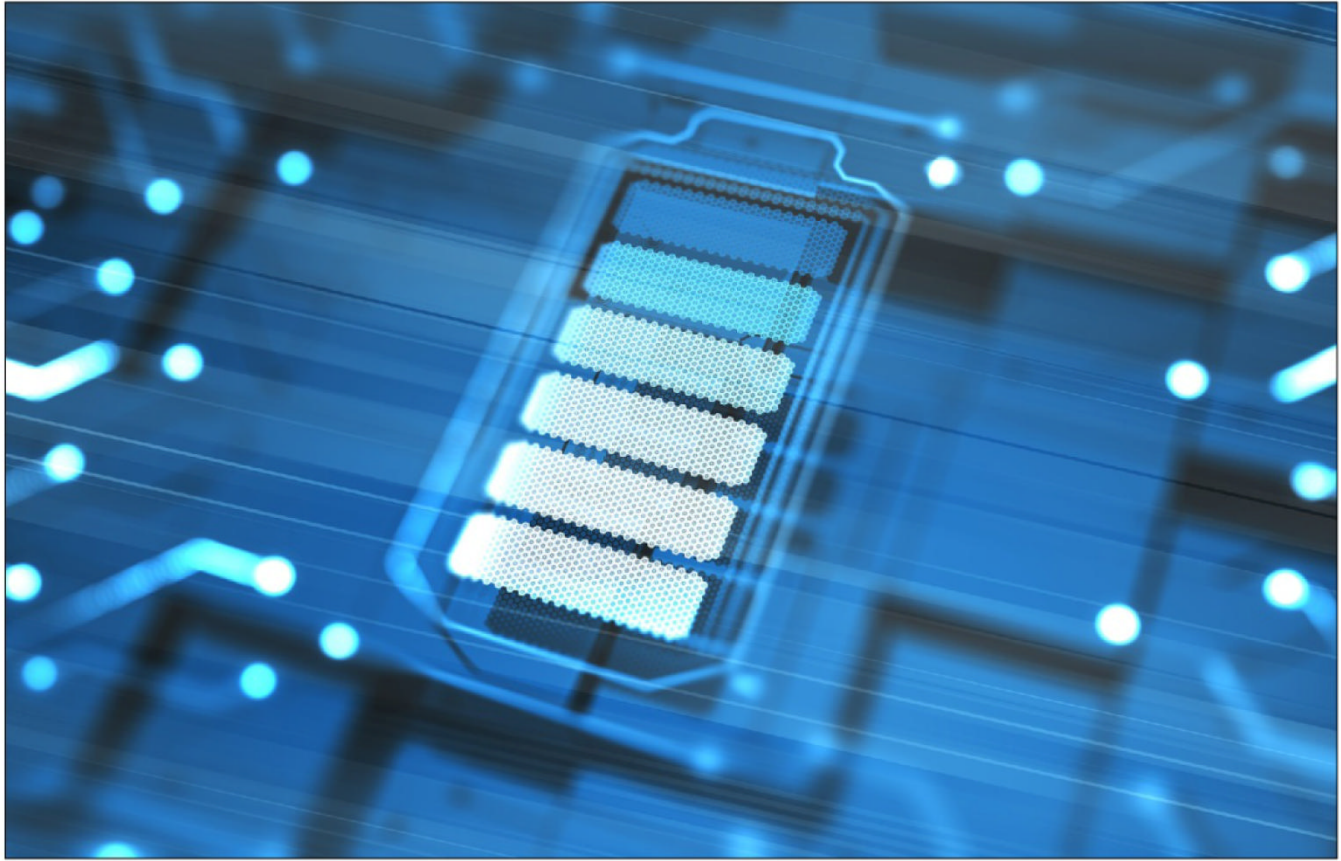
How to turn on Low Power Mode in macOS Ventura

Conserve your MacBook's battery. **Roman Loyola** reports

If you're planning to be out with your MacBook and you want to make sure you have battery life that will last you all day, you can turn on Low Power Mode. Low Power Mode automatically turns down the screen brightness and system clock speed, thereby reducing the amount of power being used and saving the battery. Apple redesigned the System Settings in macOS Ventura, but Low Power Mode is still there. Here's how to turn it on.

1. BATTERY SYSTEM SETTINGS

Open System Settings in the Apple menu, and then in the window that

appears, scroll in the left column until you see Battery. Click it.

2. LOW POWER MODE SETTINGS

At the top of the main section of the window is the setting for Low Power Mode. You have four options in the pop-up menu to choose from:

Never: The MacBook runs as it normally does.

Always: The MacBook runs with the brightness and the system clock turned down a bit, regardless of whether the MacBook is plugged in.

Only on Battery: When the MacBook is not plugged in, the brightness and system clock is turned down. When the MacBook is plugged in, the MacBook runs at normal brightness and clock speed.

Only on Power Adapter: When the MacBook is plugged in, the brightness and system clock is turned down. When the MacBook is not plugged in, the MacBook runs at normal brightness and clock speed.

Select the option you want, then close System Settings.

3. LOW POWER MODE

When the Mac is in Low Power Mode, the Battery System Setting will show that it's on and when it kicks in.

4. CHECK LOW POWER MODE

The quick way to check the status of Low Power Mode in macOS Ventura requires the Battery icon to appear in the Menu Bar. If it's there, you can click the con and see if Low Power Mode is on.

If Battery isn't in the Menu Bar, you can make it appear by going to System Settings > Control Centre, then scroll down to the Battery section and flip the switch for Show in Menu Bar.

If you want a quick way to turn Low Power Mode on or off, you must install a third-party utility. Developer Jordi Bruin made a Menu Bar utility called Cooldown that can do this – and it's free.
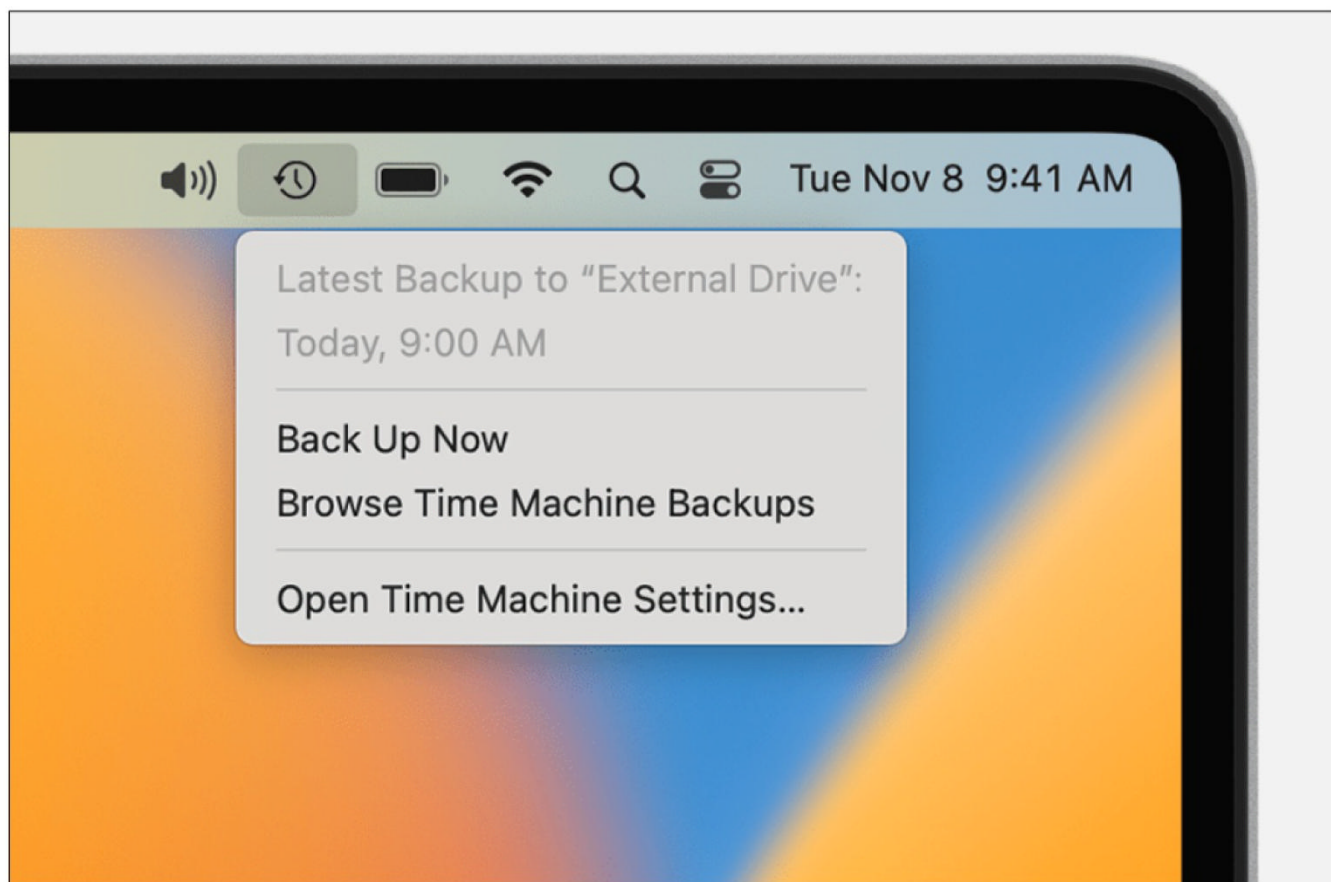
Help Desk

Solutions to all your Mac problems. **Glenn Fleishman** reports

HOW TO MAKE TIME MACHINE BACK UP TWO VOLUMES HOURLY

Some people want a belt and suspenders on their backup: two Time Machine volumes that are both kept up to date in the worst case of failure. Apple lets you attach multiple volumes to your Mac directly or over a network to act as Time Machine destinations. But macOS alternates each hour among attached volumes. Is there a way to have macOS back up hourly to both without manually clicking the Time Machine system menu and choosing Back Up Now?

Not precisely. You can try one of two alternatives:

• Use TimeMachineEditor (fave. co/3zkQX3I), a free utility (donation requested) that lets you control

certain aspects of Time Machine backups. You could change the frequency to every 30 minutes, so neither backup would be more than about 30 minutes old at any given time.

• Install Keyboard Maestro (fave. co/3JY9eZw) and set up a time-of-day or keystroke-triggered shortcut that chooses the Back Up Now option twice – it chooses the menu item, waits for it to complete, then chooses it again. That will make backups on both of your volumes.

There's another alternative, too: diversity of backups. If you have your main volume and a Time Machine backup, you don't need a second Time Machine backup. Instead, consider

using an online backup service that automatically polls and pushes file changes as soon as they're made. This can give you one backup that's seconds to minutes old at any time and accessible from anywhere, coupled with a second backup that's no more than an hour old. The only way to make that better is to have a secure off-site location where you regularly swap a Time Machine volume with another.

WHAT DOES APPLE MAIL'S 'LOAD CONTENT DIRECTLY' BUTTON DO?

The message 'Unable to load remote content privately' may not offer enough advice on how to proceed even though a Load Content Directly button appears. But the explanation isn't insidious. Rather, it's part of how Apple continues to tighten the screws on those who attempt to track what you do without asking for your permission.
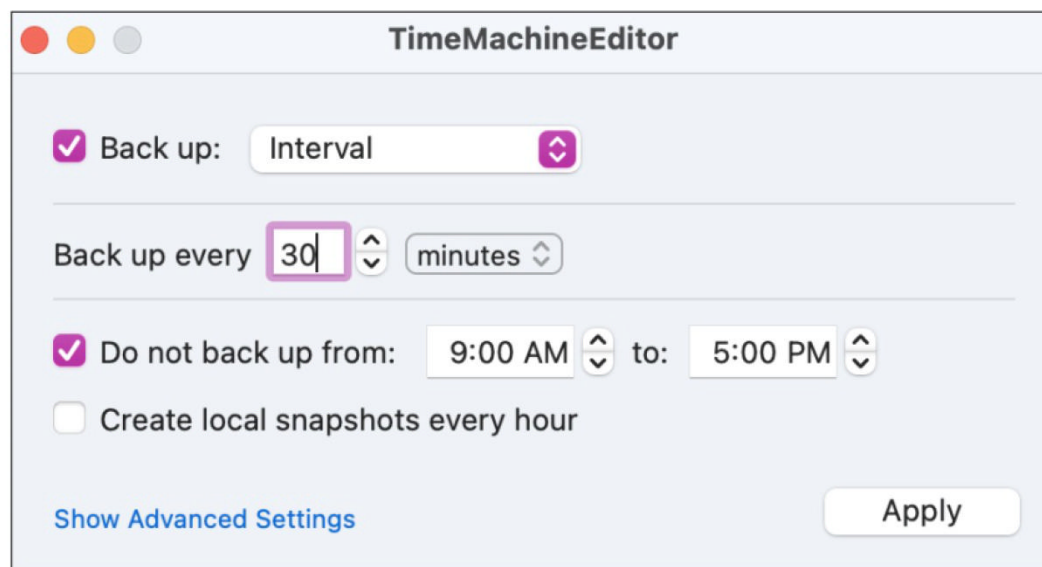

TimeMachineEditor lets you set an interval other than hourly.

You will see this error starting in iOS 15, iPadOS 15, and macOS 12 Monterey when you have Apple's Mail Privacy Protection feature

enabled and Apple can't load remote content in an email message in a way that meets the bar of what it promises.

This privacy feature allows Apple to load images on your behalf. Using a 'proxy', Apple retrieves images on its servers and then securely delivers them to your device. This prevents another party from obtaining your IP address, a unique Internet address that can help identify your location. Apple also loads the images when you receive an email, so a sender can't use that to determine whether or not you actually read a message, and they don't know when and how often you may have read it. Effectively, all a marketer or other party can tell is that an Apple server received the message.

However, Apple can't always pull off its proxy interception. The company says a virtual private network (VPN) connection can interfere, preventing it from forming the end-to-end connection required to deliver the image to your Mail
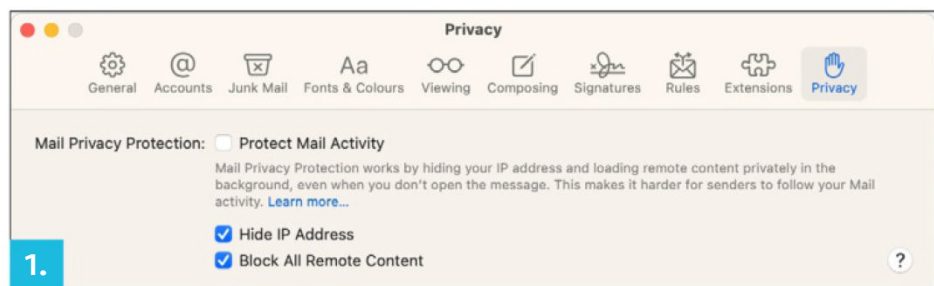
app. Your ISP (or even the country in which you're reading email) may have a network configuration that accidentally or intentionally prevents this from working, too. A too-savvy email marketing firm might also know to block Apple's retrieval, trying to force you to load images directly.

In those cases, Apple wants you to know something is wrong, even if the software can't diagnose the problem. The Load Content Directly button lets you view images, but Apple's warning is that those images may provide location and behavioural signals to the sender.

If you don't feel you need the privacy protection Apple affords or already use a VPN for some measure of privacy that interferes with Apple's assistance, you can disable Mail Privacy Protection entirely:

In iOS/iPadOS, go to Settings > Mail > Privacy Protection.
In macOS, launch Mail and go to Mail > Preferences > Privacy (**1.**).

HOW TO SHOW MISSING EMAIL IN YOUR iPHONE AND IPAD INBOX

You look at your inbox on your iPhone and iPad and find it empty. You know you had messages! They're not in your Trash or Junk folders. Where did they go? Focus on the lower-left corner of the Mail app's view, and you'll see a blue circle with three lines, from largest to smallest, top to bottom. That's the Filter button, and you tapped it without realizing it.

Tap it again, the blue inverts to white, and your email is back.

Apple added the filter feature years ago, but I keep hearing from readers and family members who encounter it unwittingly. If you don't

The blue button at top shows filtering is active; you can tap the link below Filtered by for the options shown at bottom.
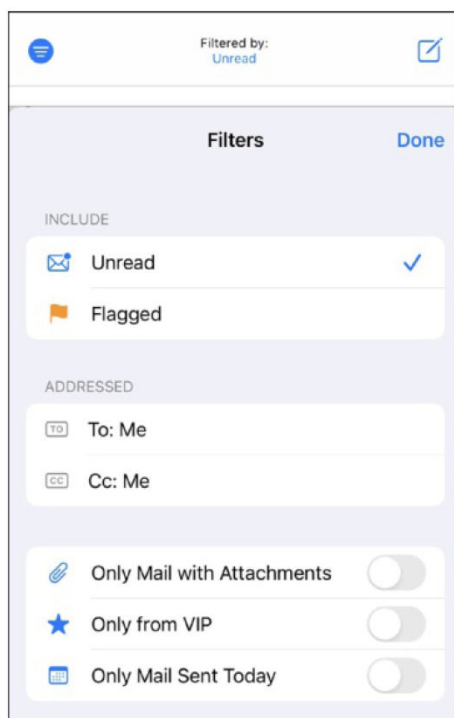
set out to use it, you don't know it's there; if you tap it accidentally, you don't have a reference point to know that's what happened.

It's a modestly flexible tool used intentionally if you have a crowded inbox. It can be more valuable to use with archived folders, though.

When you tap the icon, it changes from an open circle with blue lines to a blue circle with white lines. Then you can tap a menu to its right that reveals criteria. You can't modify these criteria to add your own filters – you have to use smart folders on a Mac for that purpose. But the filter options can be useful: you can display only messages in which you're in the main To: address field, only ones from people you added to your VIP list, or messages you've flagged. Some options can be combined, while others are exclusive.

Starting in iOS 16, you can pair filtering with a Focus mode. In Settings > Focus, select a Focus mode, then tap Add Filter at the bottom under Focus Filters. Tap Mail, then select which accounts you want to have messages from appear in Mail while the Focus mode is on. Tap Add when you're done. You can delete this filter by tapping it and tapping Delete Filter.

## HOW TO BYPASS CAPTCHAS WITH APPLE'S AUTOMATIC VERIFICATION

CAPTCHAs are, ironically, one of the most irritating pieces of technology ever invented to help humans. These tests try to stump software agents that won't be able either to identify items shown accurately or to recognize numbers and text correctly. CAPTCHAs increasingly lack value, as machine-learning algorithms have leapfrogged them. Yet they persist and have become hard for us humans to solve in order to fight bots.

Apple introduced a bypass in iOS 16/iPadOS 16 and macOS 13 Ventura that you might not have yet seen the benefit of. But make sure the feature is enabled to ensure you do. Called Automatic Verification, it's an Apple-developed system that lets the company send a token to a website that the site can accept in lieu of a CAPTCHA.

When you visit a site or use an app that requires you to solve a CAPTCHA, and it supports Automatic Verification, the developer can query your device through the browser to produce a token as a response. Apple uses one of its servers to validate that you're logged into an Apple ID account and returns a token to the requesting web server or app. Apple says that it doesn't learn from this process what app you're using or site you're visiting. Further, the party that receives the token doesn't get your Apple ID or other identifying information – it only knows that Apple vouches for you in a verifiable way. You can enable this feature, which appears turned on by default in updated operating systems. Here's how:

• In iOS and iPadOS 16, open the Settings app and tap on your Apple ID profile at the top. Then tap on Password & Security. At the bottom is a setting for Automatic Verification that you can switch on or off (**2.**).

2.
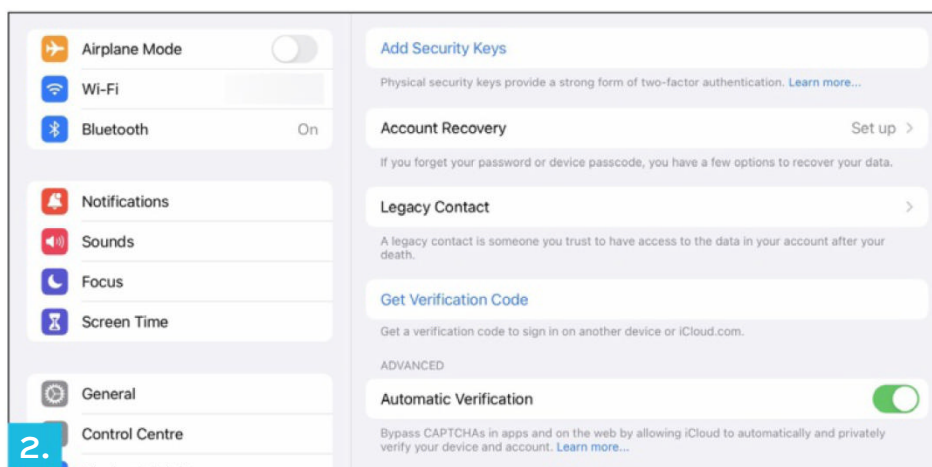
Automatic Verification is on by default; shown here in macOS.
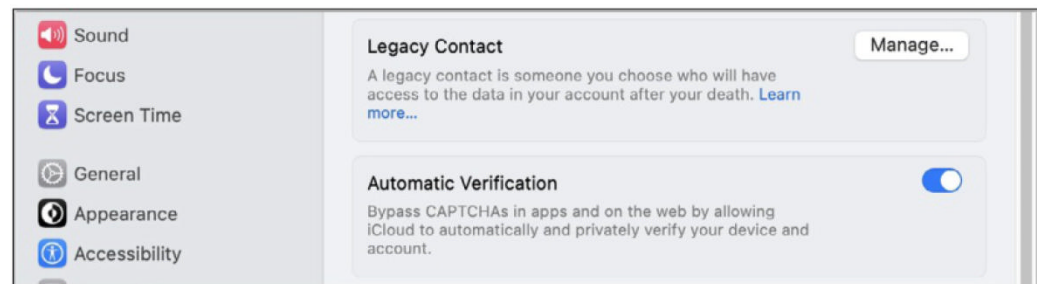
• In macOS Ventura, go to System Settings and click on your Apple ID at the top left column. Select Password & Security in the main section, then scroll down to Automatic Verification and flip the switch.

There's no way to know which websites or apps have enabled this feature. No developer or company appears to have announced support publicly, either! But with it turned on, you might notice over time that you're pestered less about your humanity than in the past.

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