AV1 is supposed to make streaming better, so why isn’t everyone using it?

When you jump into a video on YouTube or Netflix, a lot happens very quickly behind the scenes. Video data is rapidly downloaded to your device, which then has to unpack and normalize that information into a smooth, hiccup-free stream. The process of encoding and decoding video data has changed greatly over the years, with H.264 (AVC) and its successor H.265 (HEVC) remaining two of the most widely used codecs for streaming.

But in 2015, tech giants including Netflix, Microsoft, Google, Amazon, and Meta banded together to develop video compression’s latest evolution: AV1. The companies, which are part of the overarching Alliance for Open Media (AOMedia), say the video codec is around 30 percent more efficient compared to other standards like HEVC and the Google-developed VP9, allowing it to deliver higher-quality video at a lower bandwidth. AOMedia also claims that it’s royalty-free, meaning streaming device makers and video providers shouldn’t have to pay patent holders for using the technology.

That all should have been enough for AV1 to take over the video landscape. But even with all these improvements and the backing of some of the biggest names in tech, the codec hasn’t become ubiquitous. Many major names in streaming, including Max, Peacock, and Paramount Plus, still haven’t adopted AV1.

Since AV1’s debut in 2018, we’ve seen big players hop on board and use the codec for streaming high-resolution content in 4K and 8K. Google began testing AV1 on YouTube in 2018, while

Netflix added support for AV1 in 2021. Amazon Prime Video also adopted AV1 in 2021, and the codec is used in Instagram Reels as well as for screensharing in Microsoft Teams. Discord launched support in 2023, and Twitch is working on its implementation. Browsers like Google Chrome, Safari, Microsoft Edge, and Firefox have adopted AV1, too.

A flurry of devices have adopted AV1 decoders, including TVs, phones, and streaming devices

As for everyone else, there are a few reasons why they may not have adopted AV1 yet, and a simple one is hardware. For AV1 to work properly, a device has to have the hardware to support it — or otherwise run potentially resource-intensive software that can handle decoding AV1 content instead.

Within the past five years or so, a flurry of devices have adopted AV1 decoders, including TVs, phones, and streaming devices like the latest Amazon Fire TV Stick 4K Max. Chip makers like Nvidia, AMD, and Intel have launched GPUs with the tech. Meanwhile, Apple built an AV1 decoder into its iPhone with the launch of the iPhone 15 Pro in 2023, and it later added AV1 support across the entire iPhone 16 lineup last year. But not every device maker has been keen to adopt the AV1 codec, as Roku accused Google of coercing the company into supporting the standard in 2021, claiming it would drive up costs to consumers.

“In order to get its best features, you have to accept a much higher encoding complexity,” Larry Pearlstein, an associate professor of electrical and computer engineering at the College of New Jersey, tells *The Verge*. “But there is also higher decoding complexity, and that is on the consumer end.”

There are solutions for devices that don’t have a dedicated AV1 hardware decoder, but they’re just not as efficient. Google, for instance, lets Android app developers enable dav1d, an AV1 decoder developed by VideoLAN. YouTube is just

one of the apps that use dav1d, which allows it to beam AV1 videos to users on older or mid-range phones. However, some users on YouTube have reported issues with phone battery life following the implementation.

Right now, AOMedia says around 95 percent of Netflix's content is encoded with AV1, as opposed to 50 percent of videos on YouTube. "It's always going to be the chicken and egg, right?" Hari Kalva, chair and professor of Florida Atlantic University's department of electrical engineering and computer science, tells *The Verge*. "Who should build this technology before the [AV1] content exists, versus do they have enough players to play this content?"

Other standards have emerged in the video compression space, too. VVC, also known as H.266, was developed by the Moving Picture Experts Group (MPEG) and the Video Coding Experts Group (VCEG) — the same groups behind HEVC and AVC. It was finalized in 2020 and is supposed to compress video using 50 percent less data compared to HEVC, a bit more than AV1's promise of 30 percent efficiency savings. But, unlike AV1, VVC isn't royalty-free.

Even with more efficient video compression, AV1 comes with some tradeoffs that could hamper adoption. For one, compressing videos using AV1 takes more time and energy. "In order to get that higher compression, you have to spend more time getting there," Pierre-Anthony Lemieux, the executive director of AOMedia, said during an interview with *The Verge*. "As codecs get more efficient, they require more power."

Though Lemieux told *The Verge* that AV1 implementers have agreed not to charge for the use of the codec, the group's royalty-free claim might not be as clear-cut as it's presented. For years, the companies that implement video compression codecs have had to pay a fee to use the standards, typically through patent pools. Patent pools allow companies to license a group of patents for a certain technology all at

once, rather than having to negotiate with individual patent holders. Companies like the Via Licensing Alliance, Access Advance, and Sisvel manage access to patent pools for technologies like HEVC and VVC.

“Video compression, in particular, is an area that has had many, many smart people working on it for a long time,” Robert Moore, an attorney specializing in intellectual property at Volpe Koenig, told *The Verge*. “The innovations that those people have created are what I would call an IP thicket — basically a very, very challenging environment for anyone to develop technology that is a standard that’s commercially viable.”

“Our members are working on the next big thing.”

Some pools have since emerged and are claiming royalties on patents used by AV1, as outlined by *Streaming Media*, with the most recent forming in January 2025. AO Media responded to the news of the first licensing program in 2019, saying it was “founded to leave behind to leave behind the very environment that the announcement endorses and had settled “patent licensing terms up front.”

The European Union also opened up an investigation into AOMedia’s licensing policy in 2022 over concerns that its “mandatory royalty-free cross licensing” agreement could stifle innovation, as it could affect “innovators that were not a part of AOM at the time of the creation of the AV1 technical, but whose patents are deemed essential to (its) technical specifications,” according to *Reuters*. The Commission closed its investigation in 2023 for “priority reasons.”

That uncertainty still isn’t stopping AOMedia and its adopters from plowing ahead with AV1 as the future of online streaming — and working on its potential successor. “AV1 is going to be here for forever, probably,” Lemieux told *The Verge*. “But of

course, our members are working on the next big thing, and I expect something later this year.”

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