Cloud gaming: Google Stadia and Microsoft xCloud explained

Sony. Nintendo. Microsoft. Google. Amazon. Walmart. Verizon. Electronic Arts. Nvidia.

Each of these companies are giants in their respective fields — and every single one of them is or is said to be testing tech that could change the way video games are played, distributed, and sold.

Some companies have announced publicly — hey there Google and Microsoft — while others are quietly experimenting behind closed doors. But each company is at least hedging against a future where discs, downloads, even consoles are no longer required, because you'll *stream* games across the internet as easily as you stream your favorite Netflix show.

It's called cloud gaming, and it's not actually a new idea: Over the past decade, the tech's been laughed at time and again due to technological and economic constraints. But this time, it feels like the stars may have finally aligned to bring cloud gaming to the world.

Image: Google

What *is* cloud gaming, exactly?

Today, you slide a disc into your game console, or download a game's files onto a drive. Your game only looks as good and only runs as fast as the processors inside your box.

With cloud gaming, that "box" lives in a datacenter full of

servers, miles and miles away. You stream games, just like you'd stream a YouTube or Netflix video, as a series of compressed video frames – only now, those videos are reacting to your inputs. Every time you press a button for your character to jump, that input gets sent to a remote server, tells the game what you've done, and sends you a new video frame that shows you the result. Multiply by 30 or 60 frames per second, and you've got a video.

That sounds… difficult. Does any of that actually work?

Yes! And not only in the lab. We've been testing early cloud gaming solutions in the US, Europe, and Japan for almost a decade now, and it's only getting easier to play games that don't actually run on a box in front of you. One *Verge* editor has pledged to beat the notoriously difficult *Sekiro: Shadows Die Twice* using nothing but game streaming services, and he's already halfway through.

Don't just take our word for it: here are 15 ways you can try streaming game services for yourself.

What is a Stadia and how do I explain it to my parents, who will be buying me an account?

Stadia is Google's new cloud game streaming service launching November, and it's automatically considered one of the front-runners in the current wave of cloud gaming because, well, it's Google.

Essentially, Stadia is like having a game console in the cloud that you can access from any device. Think of it like how Netflix is a DVD player in the cloud – Stadia works in a

similar way, but for games. At launch, you'll be able to use it on laptops or PCs with a Chrome browser, Pixel 3 and 3a phones, and a Chromecast Ultra dongle that plugs into the HDMI port on the back of your TV. Like Netflix, you can start playing on your phone, than pick up on your tablet, laptop, or TV once you've got a bigger screen handy. Or the other way around.

So I pay a monthly fee and get access to a library of Stadia games?

Yes, but it's more complicated than that. There are three different ways to get your fix:

- Pay $9.99 a month for a Stadia Pro subscription that comes with a *very* limited library – just Destiny 2 to start
- Buy Stadia games for full price on top of your $9.99 subscription (until 2020, when the subscription is no longer required)
- Sign up for additional subscriptions (sort of like how you can subscribe to HBO through Hulu) to get access to a variety of different games.

We don't yet know exactly how many games will part of the Stadia Pro subscription library or how many third-parties will offer their own bundles and subscriptions on top, but Stadia is mainly about buying games right now.

Wow, that’s unnecessarily confusing. I thought this was supposed to be like Netflix?

Only in terms of how the games are delivered to you — not necessarily the library of games you’re paying for. Sony’s PlayStation Now cloud gaming service is a bit more like Netflix, with a big back catalog of 750+ PS2, PS3 and PS4 games you can stream for $20 a month or $100 a year, but Sony doesn’t put its brand-new heavy hitters there.

Who else is a “front-runner” in cloud gaming?

Microsoft. Heard of xCloud?

Sure. How is xCloud different from Stadia?

xCloud is Microsoft’s own game streaming service. It’s going head-to-head with Google Stadia and many others. Much like Stadia, it’s also a game console in the cloud, and Microsoft is literally sticking Xbox One S consoles in datacenters to stream games to your devices, rather than rolling out beefy game servers like Google. Microsoft hasn’t offered up much information on how you might get xCloud, but it’s planning to let you stream games to phones this October in the first public trials.

Wait, I thought I heard that xCloud would stream games from my Xbox

One. Or maybe that next-gen Project Scarlett console. Explain?

Microsoft is currently using older Xbox One S consoles as the building blocks of its cloud gaming service, but Microsoft *maybe* doesn't want that lower-performance hardware to define how good xCloud games can look and feel.

In the short term, the company's doubling down on something it's already doing, and something Sony PlayStation does as well: let you stream games from *your own console* to other devices in your home. Microsoft's calling that feature "Console Streaming," but the language the company used at E3 made it easy to confuse with the larger xCloud service.

In the long term, Scarlett will form part of the future of Microsoft's xCloud service, presumably replacing those old Xbox One S boards with newer Scarlett boards to support the very latest games that will be available on Microsoft's next-generation Xbox console. One of the benefits to subscribing to a cloud streaming service: you don't have to pay for a new box every few years to get updated hardware.

Microsoft's xCloud

So what games will I be able to play on Stadia and xCloud?

Google has revealed that at least 30 games will be playable on Stadia when it launches in November, and these include titles like *Destiny 2*, *Baldur's Gate 3*, *The Division 2*, *Wolfenstein: Youngblood* and *Metro Exodus*. That's not many to start off with, but as Stadia's popularity grows so should the list of games.

Microsoft hasn’t revealed exact launch games or pricing for xCloud, but the company has consistently said that xCloud will support any existing Xbox One game, so it’s safe to assume any game that runs on an Xbox One S right now will be available on xCloud in some way.

How much will Stadia and xCloud cost and when can I get them?

Google’s Stadia service is launching in November, and you’ll need to pay $130 to be one of the first to access the service. Google is launching its $130 Stadia Founder’s Edition which includes its custom Stadia controller, a Chromecast Ultra, and three months of premium service. The controller will also be sold separately for $69, but you can also use an Xbox or PS4 controller on a phone or PC.

Once the three months of Founder’s Edition service is over, Stadia will be priced at $10 a month for the Stadia Pro service, which will include access to some games (we don’t know how many just yet) and 4K / 60fps streaming. Google is also planning to launch a Stadia Base service that’s free but limited to 1080p streaming and stereo sound next year.

Microsoft has not yet announced pricing or subscriptions for xCloud, but you will be able to turn your own Xbox One into a free streaming server for your own games later this year. Microsoft is planning public trials of xCloud in October.

What if I already pay for a Microsoft game subscription like Xbox Game Pass?

Microsoft’s Xbox Game Pass is expected to be part of the big push for its xCloud game streaming service. Game Pass includes

more than 100 games for a $9.99 monthly subscription, but they're not streamed to Xbox consoles right now – you have to download them. Microsoft just launched Xbox Game Pass Ultimate, and it includes Xbox Game Pass for Xbox and now PC, alongside Xbox Live Gold access for $14.99 per month.

Microsoft has been focusing heavily on Xbox Game Pass, and it will undoubtedly play a big role in xCloud game streaming. We're just not sure how much it will all cost and when it will be available.

What if I've already bought some of these games on INSERT PLATFORM HERE?

It's not clear whether Microsoft will let you stream games you already own without repurchasing them – unless you're streaming them from your own Xbox, or perhaps if they're part of your Game Pass subscription (see above).

You'll definitely need to buy a new copy with Google's Stadia, the company has told us.

But there's a chance you'll be able to take your existing progress with you to the cloud. Google is making it happen with *Destiny 2*, and says it's in talks with more publishers as well. Nvidia's GeForce Now beta lets you pull in your saved games from Steam's cloud, as another example.

Is this going to be like TV subscription services where I need to subscribe to xCloud, Stadia, PS

Now, etc, to get all the games?

Sadly, yes. Content owners and publishers will pick and choose where to place their games, and there’s bound to be games that will only be available on select platforms. You can’t play a lot of Sony’s games unless you own a PlayStation 4, and Microsoft’s first-party games are often restricted to Xbox and PC. The same war will play out in the game streaming era, and you may find you’ll need to subscribe to multiple services to play every game possible.

We’ve already started to see this with Ubisoft venturing into game subscription services, and both EA’s Origin Access for PC and EA Access for console. Time will tell which service manages to be the most popular and get the vast majority of titles, but even popularity is no guarantee: much like how Netflix doesn’t have every single TV show or movie, nor will Stadia or xCloud.

Apple Arcade

Isn’t Apple doing game streaming?

Apple is trying its own game subscription service for Macs and iPhones, but these games won’t be streamed to devices just yet. Apple’s service is very similar to Microsoft’s existing Xbox Game Pass subscription, and it will have exclusives that are only available on Apple’s devices.

OK, so why would I pay for a console in a datacenter rather than

just owning one under my TV?

There are lots of reasons to still own a console, and also lots of theoretical benefits to a game streaming service. Most of this will depend on what games you're looking to play and where you play them. If you still mainly play on a TV at home, a console will likely be your best bet right now, but if you want to go on vacation and resume those same games on your phone, services like Stadia and xCloud could be the answer. Here's a shortlist of benefits:

- Play on any screen – phones, laptops, tablets, TVs, you name it. Even an old weak laptop or a phone can run the most modern games.
- The power of a dedicated gaming PC, without having to build, buy, or carry one around.
- No waiting for games to download or update – or at least ridiculously fast download speeds.
- Try a game as easily as clicking an advertisement, by launching a real, playable game in a web browser window – Stadia specifically is promising this
- Fewer ways for cheaters to prosper, since they generally can't mod the game.
- Shorter load times within games, depending on the cloud gaming company's servers. Some can have you playing within seconds.
- As soon as a cloud gaming company upgrades its servers, you get more power too.
- If anyone builds games specifically for the cloud, they could be more impressive than anything you could run on a single PC or console right now.

What's the catch?

There are definitely some drawbacks to be aware of with cloud game streaming. The two biggest ones are "how does this work for people without amazing internet infrastructure" and "who's

going to pay for those beefy servers?”

Fundamentally, someone’s gotta pay for the time you’re playing a game on that remote server, and generally that someone’s going to be you. Cloud gaming companies have experimented with full-price game purchases, subscription fees, and subsidized timed demos – basically an ad for a game that *is* the game – but nobody’s hit upon a particularly inexpensive solution quite yet.

You’ll also need a solid internet connection for cloud gaming, and we’re not just talking download speeds. The big problem is latency, or how long it takes for the remote server to respond to your commands. If you’re playing single player games then you might not notice this as much, but multiplayer games are more likely to fall victim to any lag between you and the datacenter streaming your game. This will really depend on things like the path your internet traffic takes to reach the servers, and how far those servers are physically located from your house.

When latency is bad, cloud games feel practically unplayable – and it’s incredibly frustrating if it happens in the middle of, say, a boss fight. Even in today’s best-case scenarios, cloud games aren’t necessarily responsive enough for twitchy games or competitive fighters.

Plus, there are these additional concerns:

- Just like when you started watching Netflix instead of buying DVDs, you won’t own the games anymore – and there’s nothing that necessarily keeps them from going away.
- Even if you’re streaming at 4K resolution, you’re not getting 4K worth of pristine pixels – when streaming providers compress those images, it adds noisy artifacts, which can do things like smear the sky or drastically limit how far you can clearly see distant

objects in a game.
- Cloud gaming could use a lot of data – maybe more than streaming your average Netflix show, since you're streaming at 60 frames per second instead of the 24 or 30 common to film.

Both Microsoft and Google haven't revealed any magic that will combat a lot of these issues, but Google says its Stadia controller will connect directly to servers (via your Wi-Fi) to help reduce latency.

Will these work on my crappy internet connection?

Google says a minimum of 30Mbps is required to play games in 4K at 60fps on Stadia, and games running at 1080p will need a 20Mbps connection – but again, it's also about how long it takes for a round trip between the servers and where you're playing. That's *why* Google and Microsoft are already considered front-runners in this space – they have the internet infrastructure in place to make that trip shorter than many competitors.

But that's also why satellite internet connections are probably out, and cellular connections aren't advisable, even if you're seeing speeds far better than DSL. (5G cellular networks may change things, though.) And with shared networks like public Wi-Fi, you'll be at the mercy of everyone else on the network – if someone starts download or uploading big files or streaming video, your game stream might become unplayable.

Will this totally destroy my internet data cap, which is imposed

on me by evil Comcast?

Probably.

35Mbps = 15.75 GB/hour, meaning you could burn through a 1TB monthly data cap in under 65 hours of 4K game streaming *alone*. That may sound like a lot of game time, but play one *Final Fantasy* and you might not have data left for anything else.

xCloud running on a phone

Do all of these services work on all of my devices?

Google’s Stadia service will only work on TVs via the Google Chromecast Ultra at launch, and it will be limited to Google’s Pixel 3 and 3a devices on the Android side. More devices will be supported in the future, but it’s unclear if the iPhone will support Stadia any time soon. You’ll also be able to use a Chrome browser on a Mac, Windows PC, or Chromebook to access Stadia.

Microsoft’s xCloud service will enter trials in October later this year, and the company says it plans to allow people to test it on phones and not on TVs or via Xbox consoles. Microsoft hasn’t released any information on what Android devices will support xCloud, or whether the company will have an iOS app ready for its trials.

Why is there a new console generation if both Sony and

Microsoft have streaming services?

These game streaming services are still very early in their development, and not fully fleshed out. Both Sony and Microsoft know that millions of people will buy next-generation consoles for the raw performance and high fidelity graphics improvements that these consoles always offer each generation. It’s still a vibrant and healthy market, and players will probably want a choice of console, PC, or game streaming for many years to come yet.

Plus, physical game discs still aren’t dead – both Sony and Microsoft have hinted that their next consoles will still include optical drives. Not everyone has an amazing internet connection, so it’s still too early to abandon the physical game market entirely.

Didn’t we try this all before?

Game streaming has existed for a decade, and Sony wound up acquiring early players OnLive and Gaikai to help power its PlayStation Now service. But it never really went away: Nvidia has been testing variants of its GeForce Now streaming service for years, and there are plenty of smaller competitors like Shadow, Vortex, Parsec, and many more. None of these have taken over traditional game consoles just yet, but with bigger players like Microsoft, Google, and even potentially Amazon getting involved, things could be very different in the future.

The whispers of Google, Microsoft, and Amazon getting back into cloud gaming are what spurred big interest in the idea again. They’re the three companies with the infrastructure and expertise to deliver cloud and web services to millions around the world, and the idea’s beginning to feel inevitable now that two of the three have officially bought in.

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