EMERGING TECH RESEARCH
SWOT Analysis for Cloud Gaming Startups
How gaming startups could thrive or wither in the era of streaming technology

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Market overview

Cloud gaming refers to the streaming of high-quality games from cloud servers. The current cloud gaming market generates $2.4 billion from 32 million consumers—approximately 1% of the gaming market. Estimates indicate cloud gaming could reach $8 billion by the second half of the decade.¹ Early indications of cloud gaming’s potential percolated over 20 years ago with the founding of OnLive and Gaikai. Two decades later, Microsoft’s proposed acquisition of Activision Blizzard, the industry’s largest-ever merger, was blocked by the UK’s Competition and Markets Authority (CMA) over concerns that it would create a monopoly in the burgeoning cloud gaming ecosystem. Subsequently, the EU and the Federal Trade Commission either approved the merger or failed to block the deal, which eventually closed in October 2023. These events have resurfaced debate about cloud gaming’s long-term potential.

While analysts who are bullish on the industry point to infrastructure improvements as a meaningful accelerant that can deliver cloud-streamed gaming (CSG) to underserved consumers, skeptics highlight indefensible unit economics driving an unclear value proposition. Nevertheless, demand for CSG appears solid, with surveys indicating that one-third of “committed” gaming consumers have experimented with cloud gaming services (compared with 10% of casual gamers), and over 80% are willing to use the service again.²

While cloud gaming services will continue to garner investor interest, market sustainability is unlikely until performance requirements are met, which could take the remainder of the decade. Cloud gaming is a decidedly customer-centric distribution model as a result of users consuming games on demand, free of hardware restrictions. However, considerable infrastructure challenges still exist after more than 15 years of development.³ Startups providing infrastructure and technology services to developers that help bridge the digital divide will continue to be feasible investments. Although novel, cloud-native games are compelling in theory, and this category remains largely undeveloped. If the CSG market fully materializes, the likely winners will be large technology companies that own the necessary infrastructure and content to mitigate challenging unit economics.

¹ “Cloud Gaming Revenues to Hit $2.4 Billion in 2022, up +74% Year-on-Year; Revenues Will Triple by 2025,” Newzoo, Emma McDonald, October 12, 2022.
³ “Crysis Core,” GamesIndustry.biz, Matt Marin, April 6, 2009.
## Cloud gaming timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>OnLive launches its cloud product, which offers immediate access to premium video game content on a PC or Mac via a broadband connection through a web browser.</td>
</tr>
<tr>
<td>2011</td>
<td>Gaikai launches a beta test of its game streaming service that allows users to play high-quality games in a web browser.</td>
</tr>
<tr>
<td>2014</td>
<td>Sony announces the PlayStation Now cloud gaming service based on technology acquired from Gaikai.</td>
</tr>
<tr>
<td>2015</td>
<td>Sony acquires OnLive and promptly shuts it down.</td>
</tr>
<tr>
<td>2019</td>
<td>Google launches cloud gaming service Stadia, and Electronic Arts (EA) launches a cloud gaming technical trial after acquiring GameFly’s cloud-streaming technology in 2018.</td>
</tr>
<tr>
<td>2020</td>
<td>Microsoft launches the xCloud game streaming product.</td>
</tr>
<tr>
<td>2021</td>
<td>Amazon releases its Luna cloud gaming service with free games for Prime members.</td>
</tr>
<tr>
<td>2022</td>
<td>Google shuts down Stadia after failing to attract a sufficient user base.</td>
</tr>
<tr>
<td>2023</td>
<td>The CMA blocks the deal between Microsoft and Activision Blizzard based on the forecasted growth of the industry. The deal eventually closes after additional review and concessions.</td>
</tr>
</tbody>
</table>
Cloud gaming overview

Cloud gaming startups

- B2B platform & developers
  - GAMELOFT
  - PARSEC
  - PLANABLE WORLD
  - Index

- B2C platforms
  - Blocknut
  - NOW.gg

- Infrastructure & technology
  - ubitus
  - CENVID
  - HADEAN
  - ConvWeave

Cloud gaming data flow

It remains challenging to accurately describe the cloud gaming market. The CMA’s stance that CSG warranted protection as a standalone market was one reason for the initial blockage of the Microsoft-Activision merger. Others argue that, while cloud gaming can be offered as a feature, platform, component, or input, it does not constitute a market. From this perspective, companies fit into the aforementioned categories depending on their business model, whether a CSG experience is a standalone or bundled offering, and how vertically integrated a service is.

Based on our research, we introduce another framework focused on the startup landscape, which can be organized into three categories: back-end infrastructure and technology providers, B2B services, and B2C platforms. Back-end platforms

include services like graphics processing unit (GPU) providers, data centers, content delivery networks, server orchestration, and more. Examples include CoreWeave, a Kubernetes cloud with GPU-supported workloads; Edgegap, an automated deployment and server orchestration service; and Genvid Technologies, a software development kit supporting massively interactive live events.

B2C platforms include free, “freemium,” and subscription-based platforms for games. This is a highly competitive segment as startups battle alongside incumbent platforms, like Microsoft’s Game Pass or Netflix, for discretionary consumer spending. Emerging startups include Now.gg, a browser-based collection of free online games; Antstream Arcade, a platform for retro and classic arcade games; and Blacknut, a subscription platform bundling games for direct-to-consumer (DTC) access in addition to partnering with large telecom companies. B2B providers include studios that license cloud-native games and a variety of software-as-a-service providers. This cohort includes developers like Return Entertainment and white-label platforms like Wiztivi or CareGame.

Cloud gaming deal activity

![Cloud gaming deal activity graph](image-url)

Source: PitchBook • Geography: Global
*As of October 10, 2023
The widespread adoption of AI has the potential to manage data center energy efficiency, model player behavior, and reduce maintenance costs.
Weaknesses

- **Performance requirements:** Requirements for input lag vary—figures referenced in our conversations ranged from 50 milliseconds to 80 milliseconds—but ultimately must fall under 100 milliseconds, which few games can reach. Constraints include:

- **Inconsistent 5G access:** The US has 95% coverage while Latin America has 8%. Further, networks are bound by the slowest connected player—if one user relies on 4G, all users experience lower performance. Midband standalone (SA) networks are the most viable network option for mobile CSG, but implementation remains far off. Network standards vary across providers and it is unclear how CSG games consumed across different SA networks will perform.

- **Datacenter placement:** Users need to be as close to a server equipped with a GPU as possible, but access is limited. In recent years, less than half of Google Cloud zones were equipped with GPU servers, which are more expensive than CPU-only servers. The cost challenges are compounded because scaling access to CSG instances is 1-to-1, meaning an additional instance (that is, a set of cloud resources) is required for each additional player onboarded. This also says nothing of the spike in GPU demand wrought by the generative AI boom. The paradigm is fundamentally different from TV or music streaming, where a single instance may support hundreds or thousands of consumers.

- **Wallet size:** Given that “hardcore” gamers are unlikely to embrace CSG due to satisfaction with existing hardware, multiple investors pointed to markets like India or Brazil as intriguing, but the limited 5G coverage and reduced purchasing power in those markets undermines the near-term returns.

- **Business model uncertainty:** The cloud gaming discourse often conflates different distribution technologies and subscription services, resulting in a lack of clarity that has already bred unwanted scrutiny from the CMA. Spending on subscription services peaked in 2021, and advertising-based models are difficult to justify. Serving ads requires infrastructure improvements, ads cannot be served during gameplay as they are during streamed TV, and average per-user monetization in ad-based models is unlikely to cover the costs of scaling a game. Critically, one of Stadia’s pitfalls was a pricing strategy requiring users to purchase individual titles even if a consumer owned the title on another platform. Multiple sources we spoke with pointed to a hypothetical, Spotify-like disruption wherein a single platform could aggregate content, but the degree of coordination and capital required to orchestrate a storefront of this nature remains unlikely.

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The most pressing challenge remains breaking even on the cost of serving cloud-streamed games.

Opportunities

- **New user experiences:** Maximizing the utility of cloud gaming may require consumers to embrace new behaviors, akin to how mobile and free-to-play games are utilized “on the go.” In CSG, new experiences with spectator monetization and instant access across a variety of devices may also require new habits. Owners of intellectual property may also strive to more closely integrate digital commerce into gameplay. Brands have not been able to own the end-user relationship in video games, but CSG may increase the viability of this model. Nike’s utilization of its SWOOSH program within EA’s sports games is one early use case.

- **International growth:** Blacknut’s partnership with Saudi Telecom Company follows Public Investment Fund support for Savvy Games Group’s mission to build the Middle East and North Africa region into a gaming epicenter. Turkey also established a viable market after securing significant VC activity in 2022, despite slowing in consumer spending in 2023 due to currency fluctuations.\(^\text{14, 15}\) China Mobile, China Unicom, and China Telecom all announced CSG offerings following the country’s 2019 5G rollout, and both Tencent and NetEase released CSG services at the time. Latin America similarly offers high gaming penetration, despite limited broadband infrastructure.\(^\text{16}\) In the US, the older adult population also presents an untapped market for casual CSG.\(^\text{17}\) Critically, the viability of many emerging markets depends on business models and pricing strategies.

- **Cloud-native game development:** Cloud-native development could usher in new on-boarding flows and game narratives, as well as reduce reconfiguration complexity for studios. A relatively small cohort of studios has secured funding for cloud development, including Return Entertainment and Mainframe Industries. Accelerated cloud-native game development may be feasible via infrastructure available from Microsoft Azure, Google Cloud for Games, and others. Despite Stadia’s failure, Google’s attempt to blend social and gameplay

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experiences as a value proposition of CSG was meaningful. Massively interactive live events, as demonstrated by Reddit Place, Rival Peaks (a partnership between Genvid Technologies, Pipeworks Studios, and Facebook), and the record-breaking Pokémon Red crowd-play event via Twitch, all demonstrate this potential. Another driver could be gameplay that can only succeed via cloud computing resources. AWS’ SimSpace Weaver, which manages computation, memory, and networking through Elastic Compute Cloud (EC2) instances, could support large-scale spatial simulations and push the ecosystem toward Metaverse experiences.

Threats

- **Strong incumbents:** None of the FAANG companies have presented viable solutions, but incumbent platforms may allocate resources as infrastructure costs decrease and a break-even point is attainable. Several providers have a partial edge (Sony’s content, Microsoft’s Azure, Nvidia’s GPUs) and moats that could present a material barrier to entry for startups. Similarly, incumbent platforms could opt for DTC offerings as an outgrowth of subscription offerings like Ubisoft+. Telecom companies are another provider cohort that already own infrastructure, and many simply leverage partnerships for distribution. Although Sony Music did not prevent the growth of Spotify, the competitive moats are not trivial.

- **Customer expectations:** Games have remained less conducive to streaming compared with other forms of entertainment. Although physical discs seem archaic, digital sales in gaming only exceeded physical sales in 2019. Cloud gaming is in the crosshairs of Peter Thiel’s 10x rule—consumers are largely satisfied with current experiences and cloud gaming has yet to offer the overwhelmingly superior experience required to justify the change in behavior. Microsoft’s Phil Spencer also shed light on challenges in consumer price sensitivity after shelving the company’s streaming-only “Keystone” console, having failed to reach a sufficiently low price point for the device. Content developers may also grapple with the ideal persona, which is more correlated with income than “hardcore” consumer status.

- **Regulatory scrutiny:** Regulators across the globe continue to monitor the games industry. The CMA’s blockage of the Microsoft-Activision merger is a recent example, but follows Meta’s clash with the FTC over the Within acquisition, the European Parliament’s recent vote to regulate the games industry, fines for data collection, bans on microtransactions, state intervention in China to curb gaming addition, and more. The current outlook and the completion of the Microsoft-Activision acquisition are positive developments, but lawmakers will likely monitor the sector as games push further into the mainstream. Investors we spoke with felt regulatory intervention would not materially inhibit investment until the sector exceeded tens of billions of dollars in revenue, but the sector is likely to remain on the radar of regulators.

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• **Uncertain total addressable market and serviceable obtainable market:** Improved access to high-quality games is a long-assumed value proposition of cloud gaming. Through CSG, consumers can theoretically enjoy top-tier content without high-end hardware, which could cost nearly $600 between a console and a game. Improved unit economics are compelling while inflation is high, and though two-thirds of Americans cannot cover a $400 emergency, consoles are already a mass-market product selling tens of millions of units annually.\(^{23,24}\) While there likely is a market of consumers who want top-tier games but cannot afford a console, this is not necessarily a venture-scale user base. Some stakeholders we spoke with do feel the total addressable market is sufficiently large and identify tailwinds in the fact that 90% of the population is without a console, and the capabilities of peripheral devices, like smart TVs, are improving. However, the serviceable obtainable market is likely much smaller when factoring in performance expectations and content licensing.

### Select VC-backed cloud gaming startups*

<table>
<thead>
<tr>
<th>Company</th>
<th>Total raised ($M)</th>
<th>Last financing date</th>
<th>Last financing size ($M)</th>
<th>Year founded</th>
<th>HQ location</th>
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<tbody>
<tr>
<td>CoreWeave</td>
<td>$2,781.4</td>
<td>August 3, 2023</td>
<td>$2,300.0</td>
<td>2017</td>
<td>Roseland, US</td>
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<td>StackPath</td>
<td>$766.0</td>
<td>September 2, 2020</td>
<td>N/A</td>
<td>2015</td>
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<td>Shadow</td>
<td>$169.3</td>
<td>May 4, 2021</td>
<td>N/A</td>
<td>2015</td>
<td>Paris, France</td>
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<tr>
<td>Now.gg</td>
<td>$62.0</td>
<td>March 23, 2023</td>
<td>N/A</td>
<td>2020</td>
<td>Campbell, US</td>
</tr>
<tr>
<td>Ubitus</td>
<td>$56.0</td>
<td>April 7, 2021</td>
<td>N/A</td>
<td>2007</td>
<td>Tokyo, Japan</td>
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<tr>
<td>Pragma</td>
<td>$38.20</td>
<td>October 18, 2022</td>
<td>N/A</td>
<td>2019</td>
<td>Culver City, US</td>
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<tr>
<td>Parsec</td>
<td>$34.3</td>
<td>September 7, 2021</td>
<td>$333.0</td>
<td>2016</td>
<td>Park City, US</td>
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<tr>
<td>Mainframe</td>
<td>$33.8</td>
<td>November 29, 2021</td>
<td>$23.2</td>
<td>2019</td>
<td>Helsinki, Finland</td>
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<tr>
<td>Antstream Arcade</td>
<td>$23.6</td>
<td>March 29, 2023</td>
<td>$6.4</td>
<td>2013</td>
<td>London, UK</td>
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<tr>
<td>Polystream</td>
<td>$13.7</td>
<td>January 18, 2022</td>
<td>N/A</td>
<td>2014</td>
<td>Surrey, UK</td>
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<tr>
<td>Return Entertainment</td>
<td>$9.1</td>
<td>July 27, 2023</td>
<td>N/A</td>
<td>2019</td>
<td>Helsinki, Finland</td>
</tr>
<tr>
<td>Edgegap</td>
<td>$8.1</td>
<td>November 10, 2021</td>
<td>$7.0</td>
<td>2018</td>
<td>Saint-Jean-sur-Richelie, Canada</td>
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<tr>
<td>Blacknut</td>
<td>$5.5</td>
<td>June 21, 2022</td>
<td>N/A</td>
<td>2016</td>
<td>Rennes, France</td>
</tr>
</tbody>
</table>

*As of October 10, 2023

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