

The gaming industry presents a valuable opportunity for serverless computing platforms. Over the past decade, video games have become increasingly integrated with mainstream culture, and the gaming industry has experienced explosive growth, especially in competitive esports and in mobile gaming. I believe that this rapid growth will continue for the foreseeable future, as younger generations become a greater component of the global consumer base and use gaming as a means to connect with their friends, relatives, and children.

Serverless computing platforms such as Cloudflare Workers are relevant to a variety of companies in the gaming industry. Playing a popular MOBA or FPS such as League of Legends or CS:GO requires a consistent stable connection, as reaction times in the tenths of a second are often necessary to fully enjoy the game. In this case, the ability of serverless computing platforms to run code on edge locations close to end users can help large gaming companies deliver the low latency needed to their clients. On the other side of the spectrum, small to midsize companies can find the costs of server maintenance to be prohibitive, due to the unpredictability of success with a new game release. The economy of scale that serverless computing platforms create will help mitigate such risk through taking server management out of the picture and by providing an easy way for gaming companies to scale up their capacity if they come out with a surprisingly popular game. Similarly, mobile game companies can benefit from the lack of overhead and the scalability that serverless computing platforms provide. Lastly, no matter the size of the gaming company, serverless computing platforms (that are large enough) can reduce the company's computing costs through providing them with the exact amount of processing power the company needs, and only charging them for that amount.

Of the multiple serverless platforms that are already marketing to the gaming industry, AWS, Azure, and Google Cloud would represent major competitors to Cloudflare Workers for Gaming. After some internet research, I found that AWS mostly emphasizes its partnership with the vast majority of large gaming companies, but also features in-depth player analytics for cybersecurity and marketing, utilization of machine learning to increase player engagement, and multiple AWS tutorials to create game components such as player inventories or leaderboards. Azure primarily focuses on its security services and global coverage, and provides 200 dollars of credit to new users who are interested in exploring its services. Google Cloud focuses mainly on its global presence and scalability, but also mentions its ability to provide chat translation services, improve fraud and cheat detection, and apply machine learning and artificial intelligence to achieve additional insights. Through my research, I got the impression that these three companies believe their potential customers in the gaming industry primarily care about global coverage, advanced analytics, game security, and convenient creation of in-game features.

After comparing Cloudflare Workers to these potential competitors, I truly believe that there is a real opportunity for Cloudflare Workers in the gaming industry. To capture a portion of the gaming industry's market with regards to computing platforms, I hypothesize that a company must be competitive in all three of the following areas: cost, processing speed, and global coverage. Currently, Cloudflare Workers seems to outperform its competitors in two of these areas: cold start speed and overall cost. The time required to start a new process is usually a

major component of overall processing duration, and I have seen from Cloudflare blog posts that Cloudflare Workers is over twice as fast as Amazon Lambda with regards to startup speed; additionally, Cloudflare Workers costs less than a third of what Amazon Lambda costs per million requests. Given that Microsoft/Google were not advertising their significantly faster processing speed or cheaper cost than Amazon Lambda, I assume that Cloudflare Workers would beat all three competitors in these areas; additionally, given that Cloudflare Workers has similar global coverage to its competitors, I believe that a Cloudflare Workers for Gaming service would have sufficient advantages to compete successfully. However, such an opportunity is not without risk. Companies such as Amazon, Google, and Microsoft are doubtlessly able to provide their customers with high-quality analytics insights and in-depth game design tutorials using their services, two areas which I believe Cloudflare would be at a disadvantage. Given how much gaming companies depend on such insights and tutorials from their computing platform provider, Cloudflare Workers for Gaming could face failure if it is unable to provide such features of similar quality.

In order for Cloudflare Workers for Gaming to become the market leader, more additions to the product may be needed. While Cloudflare Workers currently holds advantages over its competitors in cold start speed and cost efficiency, such advantages are likely to be eroded if Cloudflare Workers for Gaming increases in popularity, due to the ability of large tech competitors to drop computing prices in a bidding war and focus their financial and personnel resources on improving processing speed. More research is likely required regarding what gaming companies most desire from their computing platforms: for example, we could consider providing companies with a window of time in which they receive free access to a beta version of Cloudflare Workers for Gaming on the condition that they provide feedback on our product. For the time being, however, there are a few additions that I think could make sense.

One large issue that gaming companies face is how they can combat toxicity of various forms, from in-game problems such as boosting, smurfing, and griefing, to cybersecurity issues such as DDoS attacks and fraud. While competitors have attempted to address cybersecurity issues, they fail to appropriately address the monumental impact that in-game issues have on the gaming industry (increasing churn, reducing new playerbase, reduced likelihood of spending, etc). Cloudflare Workers for Gaming can position itself to outperform its competitors in both of these areas. Building off of Cloudflare's reputation in cybersecurity, it can market itself as the safest, most stable serverless computing platform, relying on a theme of trust in order to draw contrast to products offered by large tech companies which have often been in the spotlight for concerns regarding privacy and data security. In addition, Cloudflare Workers for Gaming can depict its understanding of the gaming industry by releasing code for workers that directly address in-game toxicity issues, possibly through ideas such as utilization of sentiment analysis on in-game chat logs for griefing detection, or a clustering algorithm for detection of smurfs and bots based on game duration and login time data. If Cloudflare Workers for Gaming makes it clear that it not only offers a secure, state-of-the-art computing platform, but also understands the numerous in-game toxicity issues that gaming companies face, I strongly believe it will be well-positioned to win a major share of the market.