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Thesis & Summary

As people around the world get more connected to each other every second, there is a need to have an efficient infrastructure in place to handle these requests globally. Website and online services are starting to become serverless, Cloudflare Workers applications are at the forefront of this transition by allowing developers to seamlessly scale their services globally. The compatibility of the Workers API with current solutions allows its users to easily integrate their products with our toolbox. Cloudflare Workers for Gaming (CWG) should focus on delivering a marketplace where independent game developers can explore their creative ability to build complex, networked multiplayer games and provide them the necessary resources to easily deploy their products to globally connected players.

Market Analysis and Needs

The gaming industry is a growing, and dynamic market with huge potential for game developers to explore and build creative products. According to Microsoft, there are currently more than 2 billion active gamers around the world, and all who are interconnected via a large, increasing global community. As an industry, video games generated more $119 billion in 2018 alone and studies estimate a $200 billion market share by 2022.

Currently, there exist 4 main types of gaming development studios: Publishers, Middleware, Indie Companies, and Mobile Gaming Companies. Publishers are the major players, well-established within the industry and are known for having large, efficient infrastructures in place to support their audience's usage. Major shareholders within this space, also known as AAA companies, are titans such as Rockstar, EA, or Ubisoft who have the resources to spend extensive amounts of money to produce and market their games as well. Publishers typically partner with Middleware companies who can build game engines, add-ons and provide external support. Indie companies, on the other hand, develop and publish their games digitally via independent developers who are responsible for building the product from start to finish and marketing it as well. Lastly, mobile gaming companies are emerging as strong players, capturing more than $50 billion of the market in 2019 alone.

CWG needs to target the Indie companies and the online game developers. Using the established cloud infrastructure of Cloudflare Workers, developers can address the key issues they face with building their products and marketing them as well. The global cloud gaming market is fastly emerging within the industry, with expectations to grow by 42% between 2019 and 2025. However, being a relatively new concept, developers in this area face many challenges with connectivity and latency. Unlike PC or console games, online games operate on a cloud which results in lag for gamers who are geographically dispersed from the datacenter. Given the experience that Cloudflare Workers has with managing global data centers, online game developers can address their key issues by using CWG to provide a more enhanced experience and connect global users.

Market Research Areas

In order to develop the best CWG offering, we need to understand the specific needs of the indie game studios and game developers. On the developer's side we can start by conducting surveys and interviews with industry experts to gather information on the key development workflows, deployment

issues, and any obstacles they face with cloud gaming servers. On the consumer side, we need to analyze the player's preferences focusing on the importance of graphics, visuals, subscriptions & pricing, and acceptable lag rates. Conducting this key research will help design CWG to account for developer specifications and solve any issues that a consumer might face.

Product Features

Initially, CWG should focus on supporting C++ and WebAssembly tools for developers. Since most games are currently written in C++ and most game engines support WebAssembly as a targeted output, ensuring efficient integration and support of these tools within CWG is critical. For cloud gaming platforms, CWG can incorporate Cloudflare Edge's widespread network to provide stability and efficiency. Additionally, CWG built upon Cloudflare's worldwide services will help to resolve any latency issues caused by transferring data and rendering intensive graphics from the cloud to the user. Using Worker's Isolates technology and the V8 engine, CWG will be able to provide users around the world with gaming experience that allows for faster runtimes, less memory utilization, and more security. Meanwhile, by building their products on CWG, developers can create a more flexible platform and distribute their content to a larger, global audience without trading latency issues. Furthermore, as cold starts in Workers currently only require 5ms, in-game data can be updated real-time, CWG can provide a more seamless global online multiplayer experience for users.

Product Testing and KPIs

Before the initial release, it is very important to identify features and specifications that matter most for developers and users experience and ensure that their expectations are met before releasing our product. Given CWG is a new product under Cloudflare Workers, testing the platform in a closed-beta environment with a few games would be the most effective way to collect valuable feedback from both groups and test connection speeds and cold start speeds. This would allow us to measure other Key Performance Indicators such as game load times, multiplayer latency times, and also iron out any bugs that could affect overall performance. To market CWG, we can collaborate and create partnerships with influencers on video-game streaming websites to advertise games running on our platform and increase its awareness. Starting off with indie game companies will allow CWG to build a strong foundation in the market and allow us to compete with AAA companies and big publishers in the future. After mass-market release, these partnerships with named developers and offering a variety of recognized game titles will help us reach the maximum user base.

Risk & Mitigation Factors

With any cloud-based computing, data privacy is a big risk that users are concerned about. As CWG will require in-game data to connect global users, any personal data loss will be catastrophic for not just CWG but also for Cloudflare and its partners and shareholders. To mitigate these risks, Cloudflare Workers is already carefully designed to defend against side channel attacks. Additionally, Cloudflare's infrastructure incorporates strong DDos protection to make all sites more secure. Another risk is the emergence of mobile games. For players who are not concerned with the best visuals or latency, CWG will not likely be a platform for them. However, after we have analyzed our product via Indie game companies, we can make CWG compatible with mobile games as well to reach these audiences too.