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Cloudflare Workers for Gaming Proposal

I. Overview

Cloud gaming has increasingly gained lots of attention, with major technology companies rushing to create a product that will revolutionize the gaming industry. Cloudflare Workers (Workers), Cloudflare's powerful serverless development platform, has the potential to expand services into game development. Workers already boasts more affordable and quicker services than those of its competitors -- the isolate-based platform costs 3x less and is 441% faster than AWS Lambda. However, to deem Workers a competitive product in the video game development space, it will have to tackle certain challenges. These challenges include platform support, adaptive scalability, low latency, and digital rights management (DRM). When reviewing Google Stadia, a leading cloud gaming development platform, major criticisms regard poor latency, scalability, and DRM. However, it has been praised for having a robust technology stack which allows users to develop efficiently. It also boasts a large library of well-known games available for individuals who use Stadia to game. Workers should prioritize expanding the technological capabilities of the product and ensuring a seamless gaming experience. The steps to achieve that goal involve working on adaptive scalability, lowering latency, and platform support. DRM should be considered in a later version of the product as it is heavily dependent on customer feedback. This stands under the assumptions that the initial market will consist of the United States, and Workers and its competitors share this market. Cloudflare should focus on these steps because without providing a clean user experience or proper gameplay, it will fall short of Google Stadia.

II. Scalability & Latency

High latency and poor scalability may cause bad gaming experience, especially in a quick paced game where a few seconds can decide who wins and who loses. A developer will be hesitant to use the product if the performance of the product is questionable.

User Needs: A product which can ensure low latency and proper scalability. By implementing the solution below with the impressive low overhead already present in Workers, the product will be a step ahead of one of its main competitors, Google's Stadia, which has been under scrutiny for poor latency.

Solution: A high-level, low cost solution for this is to engineer regional optimizations based on peak usage hours, paired with predictive software which will scale up or scale down cloud resources when necessary. By adding software to monitor and control cloud resources, the product will efficiently allow for adaptive scaling and adjusted latency. This is a particularly useful tool as certain regions of the world will have certain peak gaming hours due to time differences. Through training predictive software, Workers will be able to provide an optimal gaming experience for all users.

Success Metrics: Workers would be able to measure this success by monitoring input latency statistics once the product is in a testing phase. Another metric is to keep note of the cloud resources being used in order to gauge if resources are being wasted.

Risk: As the goal is to allow the proposed software model to adjust cloud resources, a major risk is that it is trained poorly. This may lead to wasting of cloud resources and financial losses. One way to assess this risk is to deploy the software in canary rollouts such that it is easy to assess correctness.

III. Platform Support

One major concern is that Workers has yet to be equipped with the tools necessary to properly develop and support video games. This is crucial, as a developer without the necessary technologies at hand will be unable to create a worthwhile video game.

User Needs: A platform with the necessary tools for game development. Google Stadia already has been continuously editing and updating their development platform. It would be key to follow on a similar path to ensure a competitive product.

Solution: A solution is to add certain video game developer resources to the Workers platform. For example, Cloudflare could partner with Epic Games in order to have access to Unreal Engine, one of the world's most powerful creation engines. Similarly, it would be advantageous to also integrate Unity, a leading platform for 3D/AR/VR development. In terms of supporting gameplay, Workers's software stack must be updated to allow for API usage, which include game management features such as saving games, multiplayer modes, and pausing/resuming gameplay.

Success Metrics: Metrics such as Daily Active Users and retention will allow Workers to evaluate how successful the game is. Another possible metric would be how many new games are being actively developed and launched.

Risks: When the development platform increases in size and capabilities, it runs the risk of working slowly and inefficiently. This is a major downside to expanding the Workers platform, and will have to be optimized in the best way possible.

IV. Timeline

In order to properly test and scale the product, the timeline for expanding into the global market will be incremental.

1) The first version of the product will only focus on PC gaming and be released to the United States to ensure that the product is sustainable at a small scale. To achieve this, Workers would need to make the additions mentioned above and allot time for proper iterative testing.

2) The next step would be to market Workers to game developers globally and hire them to begin development on the platform. During this step, Workers should focus on acquiring user feedback and using it to update the product as quickly as possible.

3) The final step would be to host the games of developers and assess how successful they have been using various metrics: input latency, daily active users, and retention. Again, this step will focus on receiving feedback from our users and gamers on how Workers can improve our product and market the product more efficiently. By gaining constant feedback, our team will be able to properly assess needs of the changing market.

The estimated timetable for this process is using 4 months to make aforementioned additions to Workers, taking the next 5-6 months to develop games and use feedback to continually update Workers, and completing the process in another 5-6 months by hosting games in the United States.

V. Risk

Although the appeal of the gaming industry is obvious, allowing Cloudflare to tap into the industry with Workers poses various risks. For example, one requirement for cloud gaming is that the gamer has strong internet connection. Although this particular problem doesn't pertain to the United States, it may present difficulties in other countries. An even greater consideration is that many internet providers have caps on how much data can be used in one month. At a data cap of 1TB per month, one can only get a maximum of 65 hours of total Google Stadia playtime at 4K 60 FPS, which is only a few hours per day (nothing unusual for a

competitive gamer). In addition, another risk to assess is the quick saturation of the cloud gaming market. With an already large game library, Google Stadia has made partnerships with popular gaming publishers such as EA. Workers will only become competitive if it can host a greater number of games. This can be done by partnering with video game publishing companies -- a potential user base for Workers. Stringent monetary assessment will also need to be evaluated to ensure that these plans are viable under Cloudflare's current financial plan.

VI. Future Plans

In order to remain competitive among top cloud providers, Workers must continuously expand. Workers should begin platform and global expansion if deployment on PC in the United States is successful. These plans would include hosting games globally first on PC, then providing services for television, mobile, and tablet gaming in the United States, and finally going fully global. Another plan for expansion may include partnering with gaming publishers, allowing Workers to increase the gaming library.