Cloudflare Workers for Gaming

With the rise of cloud gaming and gaming-as-a-service models, Cloudflare Workers for Gaming can focus on minimizing latency while providing game developers additional tools to help deploy and manage their product. While this product could also be positioned in a way for streaming companies like Nvidia's GeForce Now, this report will focus on mainly first-party developers of video games as the target segment. The Cloudflare Workers serverless computing system could be modified to handle an online game's needs of load-balancing, the process of distributing requests across multiple resources to maximize efficiency, in the face of surges in player traffic. The simplicity of this product would allow developers to not worry about the horizontal scalability of their games and focus on the applications themselves.

Modifications to Cloudflare Workers and Potential Testing Initiatives

Many large companies of massive online games, such as Riot and its competitive online game League of Legends, have built and host their game off of their central servers. However, many have gone a step forward and built their own internet backbone to support the game. Traditional servers typically drop small packets when they are overloaded, but this packet loss is noticeable and detrimental to online video games. The data from video games is different than typical static data or even streaming data from other forms of media. Those packets on average tend to be around 1,500 bytes, while in contrast a packet of gaming data can be as small as 55 bytes. Thus, the product Cloudflare Workers will have to be fine-tuned for these network optimizations. Having access to a distributed server network might indeed reduce players' latency when accessing games, but packet loss would disrupt the entire experience regardless of ping. To test the new system, an experiment could be run using many virtual machines to replicate online gameplay and keeping track of packet loss during the session. Moreover, during development of the end product, select game developers, most probably mobile game developers who have many players from all around the world, could be chosen to have free trial versions of Cloudflare Workers for Gaming and data from the trial-run could be used to determine whether network optimizations for video games would be required.

Another useful addition for video game developers, assuming they would be using Cloudflare Workers for Gaming for all their traditional server needs, would be implementing a database feature that collected events received from game machines. Loss of player progress or data in a game can result in the loss of loyal players and thus the system should automatically keep a backup of the game data. While Cloudflare Workers for Gaming could handle all the database needs for game developers, it is probably a better idea to allow video game developers to decide for themselves how to keep what data. This is because some forms of video game data are typically kept in relational databases, such as microtransactions, while other forms of video game data are kept in NoSQL databases, such as game state information. Game developers, especially for mobile games, constantly introduce new content and thus new data for video games, and so their database schemas must also be able to readily change. Creating a dashboard for developers to manage their databases would give developers the ability to customize their databases to how they need them. This most probably from a technical standpoint would need some sort of link to 3rd-party databases like Amazon Web Services and Microsoft Azure. At the end of the day, database changes and limitations are shown in the face of game success and so it would be difficult to pre-test how effective the dashboard would be at helping developers. However, surveying a variety of video game developers could at least give an understanding of the common perception of the dashboard.

On the subject of a dashboard, Cloudflare Workers for Gaming should also include some form of data analytics for the game developer. The analytics feature would take events from the game, analyze

them in real-time, and then also store them somewhere for post-processing. This data could then be presented in the form of a dashboard to the developer, similar to the dashboard for databases. In this data analytics dash board, the initial features could simply be detecting player hackers, detecting game bugs due to patches, and some general metrics such as general player statistics like average ping. As time went on, more features of this dashboard could be rolled out based on reception of the data analytics dashboard and feedback from developers on what they would like to have access to.

Risks and Future Steps

There are many risks associated with the product outlined above. First, is adoption. Many developers might simply trust themselves to maintain their own central server and thus would be reluctant to put their game's experience in the hands of a third-party. Second, are alternatives. Other companies who provide serverless computation products might expand into the same or existing cloud gaming platform providers must expand their offerings to include the backend development side as well. Third, is industry trend. Right now, the trend is for online multiplayer games. However, the video game industry has seen inflection points in the past, and it is possible that an inflection point comes in the future where players are fatigued from the vast array of online multiplayer microtransaction-filled games and turn back to single-player experiences. These are just some of the possible risks involved with the product offering.

The best way to limit the risks and ensure future success of the product would be to gain a better understanding of the market and test the product as soon and as many times as possible. Probably the best way to understand the market would be to gather information from various kinds of developers from various genres and formats of games. Ideally, would want to speak directly with developers ranging from large online games to small indie games. However, surveys and access to the developer portions of conferences such as GDC could also give insight into understanding the market. It would also be beneficial to see if any developers are already using some form of serverless architecture to support their games in order to determine whether Cloudflare Workers for Gaming had existing competition or alternatives. Probably the best way to test the product would be to have developers build games off of it. One way of incentivizing early adoption would be running a form of a challenge where developers create launch games using Cloudflare Workers for Gaming and the community favorite wins a prize. This would lead to smaller, independent developers to use and test the product. This could also be used as a proof-of-concept and show larger, first-party developers that they might also benefit from its adoption. All in all, with the way the video game industry is trending, serverless computing is bound to be an integral tool used by developers, and Cloudflare Workers is strategically positioned to offer a holistic solution for those developers.