Cloudflare PM Internship Application - Augustine Santillan
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Thesis

Currently, Cloudflare Workers could improve networked video game delivery by allowing many functions normally handled by login and game servers to be handled by the Workers Infrastructure instead, reducing lag for players by utilizing our extensive data center network.

In the future, Cloudflare Workers for Games should support running entire video games on a serverless architecture, erasing the need for significant effort or spend on infrastructure.

Initial Use Cases

Cloudflare Workers should already be able to provide the following benefits for video games:

- Dynamic inter-language content translation (e.g. English -> Spanish)
- Faster authentication through KV
- Storing in-game action history into data collection platform for analytics + fraud detection
- Caching game environments (text and/or graphics) and only retrieving dynamic information on game state from servers
- Deploying simple logic for “client-side” prediction of in-game action results
- Deploying simple games that can live entirely in-network / do not require server
- Mitigating DDoS risk, similar to our existing Minecraft solutions
- Lower cost and lag for all of the above by utilizing our extensive data center network at only the needed scale at each point in time rather than renting entire servers

Market Research Plans

- Interview different market segments - the requirements for deploying Fortnite will differ significantly from text-based “story” games. interviews should capture the breadth of unmet requirements to inform which users and needs we should target.
- Try it out ourselves - We should have our developers attempt to deploy their own games or simple external ones as proofs of concept for the platform’s listed use cases above. This could be a passion project for them that will validate what Cloudflare Workers can already support versus what will need to be built out further.
- Better understand competitors - GCP and AWS already have gaming offerings, along with companies that specifically provide gaming cloud infrastructure such as Maxihost. We need to develop a POV on their strengths and weaknesses, potentially by having developers attempt to deploy games using these solutions, similar to the above.

Product Feature Recommendations

To take the next step and allow entire games to be hosted on Cloudflare Workers, we will need:

- Increased resource availability - each Workers instance can only consume 128MB currently, which will likely not be enough. We will either need to expand infrastructure or make it more flexible to handle this scale, potentially by leveraging the TransformStream API. Similar problems likely exist with KV's 10MB limit per value currently.
- More robust testing scheme - video game developers frequently cite testing edge cases and cheating pathways as a pain point, and Cloudflare Workers will likely need more than its current sandbox setup to support these needs.
- P2P blockchain support - Cloudflare Workers' decentralized setup could lend itself very well to a new generation of P2P games that are operated and tracked via blockchain. Scale is cited as a common blocker to expansion of these solutions, and Cloudflare should bring its Ethereum and scalability expertise to helping solve this problem.

Methods to Improve Quality

- Pilot programs - we should partner with smaller studios on early-stage games to see if they are willing to develop and deploy these new games using our setup at no costs - migration of existing games will likely be too difficult. Significant Cloudflare support will be needed to make these first implementations work, but this will give us valuable product feedback and insight on how to make future deployments faster and easier.
- Specific documentation for video games - explaining how our solutions can be used in gaming, along with detailed how-tos, will refine our thinking and give developers materials to provide feedback on to improve the product's features and usability.

Goals / Metrics for Success

- Specific partnership: We should seek to convert one of the above pilots into a multi-year partnership where the studio co-creates the next generation of the product with us and deploys their newest releases using Cloudflare Workers for Games. This will ensure we are meeting customer needs and give us credibility for future sales.
- Excitement in online communities: Independent game developers should be excited by our product, such that they are using it themselves, talking about it on the Cloudflare forum, and writing (positively) about it on their own blogs.

Risks

- Migration difficulty: Containers are very customizable and have thus seen adoption in video games, even for companies as large as EA. While Cloudflare Workers is fast and easy to deploy due to its standardized nature, this may not be the best option for video games, especially those with existing codebases that would need to port over.
- Language support: Cloudflare Workers only supports JavaScript, and online commentators have noted that the V8 WebAssembly compiler can be tricky to work with. Video game developers may decide it is not worth the effort to create this compatibility.