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Memory and Storage Management

When considering what specifications would allow the game, Draw It or Lose It, to run efficiently, a blend of both memory and storage would make the most sense. The specific approach I would take is first assessing the amount of storage the images will take up. Since there will be about 200 high-definition images that the game will use, these should be stored on storage, preferably on a solid-state drive (SSD). SSDs are known to provide faster read and write times than a hard-disk drive (HDD). Although SSDs are more expensive than HDDs, they are still less expensive than straight memory. If each image is about 8MB in size, it would roughly take up about 1.6 gigabytes (GB) of storage. HDD storage is around $0.04-$0.06 per GB, while SSD is about $0.10/GB (Brant,1). Going with SSD storage would make it about $0.16. This, of course, isn’t factoring the database storage of users and their account info. Therefore, it would be wise to go with a bit more storage space to allow for more images and user info stored in the database. I believe 10GB of SSD storage for $10 would be a great investment to start.

The calculations so far have not factored in the number of games that would be played and this is because I believe understanding what should be stored is to be considered as the foundation since it’s a factor that will remain constant. As for the number of games, Draw It or Lose It aims to have about 1,000 games going at once with 4 players each, making it able to support 4,000 clients. To support every game, we would want to ensure that each image is being delivered fast and is readily available. For this to happen, memory should be considered over storage because memory is faster when reading and writing. In this case, when a game starts, memory will read from the storage and write it to the four users in a game. Memory is more expensive that storage, but it’s important to keep the user engaged and if your images taking to long to load, you may lose that engagement. To support 4,000 clients, you would need about $20,000 of memory. This is quite expensive, so another approach can be taken to reduce this cost. You can have a filesystem that has the room for 4,000 clients in a database. If you store the images on the user level, you can avoid having to read and write from the main storage where we initially decided to have 10GB of SSD and instead only have to worry about using memory for the game itself. This can bring you down to only needing memory for the 1,000 games at a time making it about $5000 needed instead.

The game itself will rely on memory if there’s more work to get from A to B and B to C (storage to game and game to user). But if you can bridge the gap by using memory to bring the images from A to C and storing them in C, then you should be able to get away with using less memory and more storage for more financial efficiency. But overall, it can definitely be tricky when considering all of these options, which is why I’m in favor of a serverless architecture. Mostly because you may not always need to have that many resources at a time. There are slower days than others and you may not have that many games going on all the time. So, one day you may need less memory while more on others. It’s the ideal choice for flexibility.

Reference

Brant, Tom. “SSD vs. HDD: What's the Difference?” *PCMAG*, PCMag, 2 Sept. 2020, www.pcmag.com/news/ssd-vs-hdd-whats-the-difference#:~:text=A%201TB%20internal%202.5%2Dinch,per%20gigabyte%20for%20the%20SSD.