Kyle Riggenbach

Feb 19, 2023

CS230 Operating Systems

1. **Operating Platform:** Recommend an appropriate operating (server) platform that will allow The Gaming Room to expand Draw It or Lose It to other computing environments.
    a. Each platform in terms of desktop, mobile, web have their share of advantages and disadvantages.
        i. Desktop (Windows PC)
            1. Advantages
                a. Most powerful
                b. Most immersion with a keyboard and mousing being the input devices, giving the user the best control.
            2. Disadvantages
                a. Lowest market share in the amount of PC owner has been decreasing
                b. Highest barrier of entry with expensive hardware.
        ii. Mobile
            1. Advantages
                a. High accessibility with mobile phone being owned by everyone
            2. Disadvantages
                a. Two separate development pipelines (android/iOS) to properly saturate the market.
        iii. Web
            1. Advantages
                a. High accessibility, maybe highest since any device can access a website.
            2. Disadvantages
                a. Capped performance as a web browser can only render so much.
                b. Network reliant with internet availability being a basic requirement.
2. **Operating Systems Architectures:** Describe the details of the chosen operating platform architectures.
    a. We have a few viable options

        i. Arm: not powerful compared to x86 has many limitations. The maximum possibility on arm arch is mobile gaming.
        ii. X86: very powerful, huge development so easy to develop game on platform like Unity and Unreal Engine, huge hardware compatibility and support
        iii. Here we are discussing on arch so Intel and AMD both included X86 and yes X86 does not refer to specific 32 bit it can be 64 bit since nowadays 64 bit is expected.
3. **Storage Management:** Identify an appropriate storage management system to be used with the recommended operating platform.
    a. There are two common storage management systems that we could use
        i. Hard disk drive
            1. Cheaper but old. The money saved is usually not worth the speed sacrifice by using an HDD.
            2. Could be used in unison with an SSD to hold large files that do not need to be quickly accessed.
        ii. Solid state drive
            1. Expensive and almost standard in most devices today. Makes loading and grabbing items quick.
            2. Often the primary drive to load quickly, but often works together with an HDD to shift larger stuff to it to keep the primary SSD clear of clutter.
4. **Memory Management:** Explain how the recommended operating platform uses memory management techniques for the Draw It or Lose It software.
    a. As recommended by Windows, each process on 32-bit Microsoft Windows has its own virtual address space that enables addressing up to 4 gigabytes of memory. Each process on 64-bit Windows has a virtual address space of 8 terabytes. All threads of a process can access its virtual address space. The threads work in isolation as well to prevent any cross corruption.
5. **Distributed Systems and Networks:** Knowing that the client would like Draw It or Lose It to communicate between various platforms, explain how this may be accomplished with distributed software and the network that connects the devices. Consider the dependencies between the components within the distributed systems and networks (connectivity, outages, and so on).
    a. Headless architecture is what the client could use to accomplish this. We could build an API for them that sends out simple JSON files to any platform that their game is on. Each platform would be able to receive the JSON files and then convert that data to the platform specific way of rendering it to the user. This gives the game a unified feel as all communication is centered into one API

protocol that can work with any platform. The disadvantage of this is that playing the game would be limited to internet availability.

6. **Security:** Security is a must-have for the client. Explain how to protect user information on and between various platforms. Consider the user protection and security capabilities of the recommended operating platform.
    a. The biggest security threat is accessing the users information that is located in the database. Things like emails, passwords, addresses, and phone numbers should be protected as best as possible. We can protect those with some standard practices like encryption, input sterilization, role management, etc. Beyond that there will be some more common things to protect against like social engineered attacks and such that will be looking for sensitive information that could be auctioned off for money.