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Online Video Game Streaming using Cloud Gaming

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Abstract **-The present paper mainly focuses on review of cloud gaming. In cloud gaming, sophisticated game runs on powerful servers in data centers, rendered game scenes are streamed to gamers over the Internet in real-time, and gamers use light-weight software executed on devices to interact with the games. Computer games used to take more time to get installed on Computer systems as games are too complicated and the computer hardware has low specifications. Gamers have to repeatedly upgrade their computers to play latest computer games. Cloud gaming is a system that has the potential to make virtually any video game, regardless of system requirements, to be played on almost any system.**

Keywords **-Cloud gaming, video game streaming system.**

I. INTRODUCTION

The problem occurred during the rise of Gaming industry. With each new game launched in the market started demanding higher graphical capabilities. Users had to upgrade their systems in order to stay up to date with this growing market. It used to cost a lot of money for the expensive upgrades. and it wasn't even 100 percent guaranteed that the upgrade that they just bought is not going to get outdated soon. Cloud Gaming is a way to stream high end video games that are to be played on PCs having low specifications. The traditional method of playing video games was to buy a physical disc or digital copy of the game, then wait for hours of installation and it will not even play if your machine does not match the specifications. So, we can tackle this problem by using cloud gaming. There are tremendous advantages for cloud gaming to gamers, service providers and game developers.

For gamers:-

1. Access to the game anytime and anywhere.
2. Can buy games on-demand
3. There is no need to upgrade the hardware.
4. It has features where we can see the ongoing tournaments and also share game reply's with people or friends

For game developers:-

1. Avoiding piracy because as the game software is never downloaded to client computer.
2. For reducing the testing costs and porting concentrate on a single platform.

For service provider:-

1. Creates more demands on already deployed resources.
2. Leads to new business model [2].

Abbreviations and Acronyms -

1. RTSP- Real Time Streaming Protocol.
2. RTP- Real-time Transmit Protoco.l
3. OpenGL- Open Graphics Library.

II. METHODOLOGY

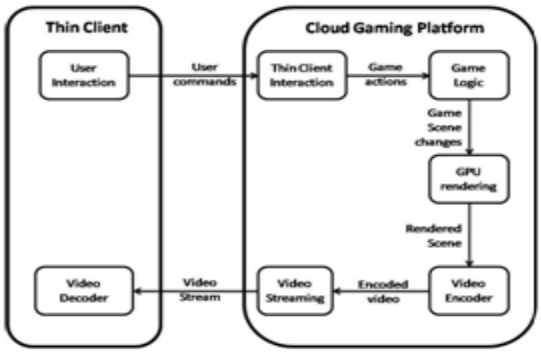

Fig.1. System Architecture.

Figure 1 presents the high level system architecture of cloud gaming. It shows the various functions and modules required by a cloud gaming system. The user selected game first run on the cloud server. As can be observed, a player's commands must be sent over the Internet from its thin client to the cloud gaming platform.

Thin client has the lower system configuration but the high speed internet facility. Command scan be sent via standard HTTP or HTTPS protocols. Once the commands reach the cloud gaming platform they are converted into appropriate in-game actions, which are interpreted by the game logic into changes in the game world. The game scenes changes are then processed by the cloud system's graphical processing unit (GPU) into a rendered scene.

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The rendered scene must be compressed by the video encoder, and then sent to a video streaming module, which delivers the video stream back to the thin client. The streaming module uses the standard RTSP and RTP protocol to transmit the A/V frames from cloud game server to the client. Finally, the thin client decodes the video and displays the video frames to the player.

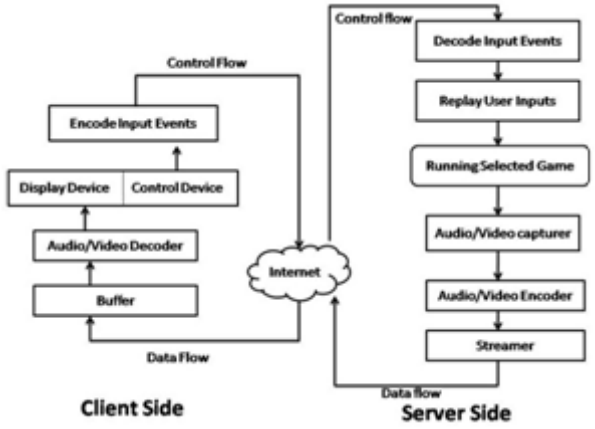

Fig.2.System Flow.

III. LITERATURE SURVEY

C.-Y. Huang Et.al [1] gives the brief idea about the Gaming Anywhere - The first open source cloud gaming system, and the actual implementation of cloud gaming. They design Gaming Any-where for high extensibility, portability, and reconfigurability. They implement Gaming Anywhere on Windows, Linux, OS X, and Android. They conduct extensive experiments to evaluate the performance of GamingAnywhere's.-Y. Huang Et.al [1] states that for commercially-successful cloud gaming services, the cloud gaming systems must deliver high quality videos with low response delay, which is difficult in the best-effort Internet. The response delay refers to the time difference between the client receiving a user input and the client displaying the game frame reflecting that user input.

B. Mariano Et.al [2] discusses the future of gaming industry and if the industry is willing to accept cloud gaming as its primary way of gamingand they discusses the today's cloud gaming systems and proposed systems for future. They also discusses the issues related with the cloud gaming.

H. Schulzrinne Et.al [3] is about of Real Time Transport protocol. The Real-time Transport Protocol is a network protocol for delivering audio and video over IP networks. RTP typically runs over User Datagram Protocol (UDP). RTP is used in conjunction with the RTP Control Protocol (RTCP). While RTP carries the media streams (e.g., audio and video), RTCP is used to monitor transmission statistics and quality of service (QoS) and aids synchronization of multiple streams. RTP was developed by the Audio-Video Transport Working Group of the Internet Engineering Task Force (IETF) and first published in 1996 as RFC 1889, and superseded by RFC 3550 in 2003.

H. Schulzrinne Et.al [4] is about of Real Time Streaming Protocol (RTSP). The Real Time Streaming Protocol (RTSP) is a network control protocol designed for use in entertainment and communications systems to control streaming media servers. The protocol is used for establishing and controlling media sessions between end points. The client uses commands like play, pause, fast forward to control the media stream sent by the server. The transmission of streaming data itself is not a task of RTSP. Most RTSP servers use the Real-time Transport Protocol (RTP) in conjunction with Real-time Control Protocol (RTCP) for media stream delivery.

Yu-Chun Chang Et.al [5] is about the performance of thin-client games. Thin-client is centralized Model. Which offers a solution to resource intensive applications? The thin-client model is considered a perfect fit for online gaming. As modern games normally require tremendous computing and rendering power at the game client, deploying games with such models can transfer the burden of hardware upgrades from players to game operators. As a result, there are a variety of solutions proposed for thin-client gaming today. However, little is known about the performance of such thin-client systems in different scenarios, and there is no systematic means yet to conduct such analysis.

IV. CONCLUSION

Cloud Gaming is a newly emerging technology where the only constraint might be the input lag and video latency. But if we keep those two constraints aside then we have a state of the art system which is theoretically capable of performing any task given to it. Since its inception cloud gaming has changed the way we use or share resources over the internet. After trying out various approaches the best one seems to be a java based application where we can have multiple modules interacting together to give player an immersive experience.

Screen is recorded and sent over to the server while the input is captured at the client side and resent back to the server. Cloud gaming can be a intriguing as well as dissatisfying experience but considering that wide range of proposed ideas that could presumably all work together to create an overall substantially better gaming experience, cloud gaming may make it to the mainstream market faster than some might think.

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