

Chapter 4

Cloud Gaming: Design Architecture and Challenges

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ABSTRACT

This chapter talks about the architecture required for cloud gaming and various challenges in cloud based gaming. The first part gives a brief introduction about what is actually cloud gaming and the ways in which it is implemented. The subsequent section talks about the cloud gaming system architecture and different server, client components of cloud gaming frameworks involved in the whole process. The next section talks about various cloud based services and their system architecture. In this chapter main aspect is the server client architecture and data flow models via this architecture. A comparative study has been made among various service providers to have a better understanding of the architecture deployed by them in cloud based gaming. The next section discusses about the Challenges of Cloud based Gaming. The future and new improvisations of the Cloud based Gaming System has also been taken up in this chapter.

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INTRODUCTION

Cloud computing mainly helps in distribution of power among all developing countries. It will provide power to developing nations to access software's once reserved for developed countries. Small scale businesses will save money spent on large expenditures by using services such as Amazon's Elastic Compute Cloud which is mainly used to store and manipulate their data instead of spending huge amounts on buying servers. Sensors will start playing a major role in items such as lights, agriculture tools and handheld devices thus helping in transmitting data across the Web and then into the cloud. Through the utilization of widely deployed data-centers and elastic resources, cloud computing has opened a new field with countless new opportunities for both new and ongoing applications. Existing applications ranging from file sharing, file uploading and data synchronization to media streaming, all have experienced a great leap forward in terms of enhanced efficiency and reusability through cloud computing platforms. Most of the developments in this field have come from exploring the cloud's massive resources with computational offloading and reducing jitter in data transfer along with user access latencies with strategically placed cloud data-centers. Recent developments in field of cloud computing have expanded to allow offloading not only of prevalent computations but also of much more complex tasks such as high definition 3-D rendering, which turns the idea of Cloud Gaming into a reality. Cloud gaming simply accesses an interactive gaming application from a distant place via cloud client servers and streams the scenes as a video sequence back to the player over the Internet with minimal delay. A cloud gaming player interacts with the application through a layered thin client, which is mainly responsible for displaying the video from the cloud rendering server as well as collecting the player's commands and his moves and sending the interactions back to the cloud via server. This will bring a great reform in gaming industry.

SYSTEM ARCHITECTURE

We can see that a player's control moves must be sent over the Internet from its thin client to the cloud gaming platform i.e to the pseudo player on cloud, so once the command or the control reaches the cloud gaming platform they are transformed into appropriate game actions and moves of multi players, which are then understood and executed according to the game logic resulting into changes in the game world. The changes perceived in the game world are then processed by the cloud system's graphical processing unit (GPU) into a combined scene. The interrelated combined scenes 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.

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