Asynchronous Multiplayer In Video Games

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1 Abstract

2 Introduction

This paper serves to provide information regrding how a game's players can network asynchronously and how that can be used to create unique gameplay elements which entice the player.

For the paper, a game called *War and Legacy* has been developed to demonstrate how asynchronous gameplay in video games can be utilised. This game works similar to Reigns[4] in its card based, choose your own adventure style gameplay, where a player rules a kingdom a must try to not be overthrown by various hazards within the game. These hazards are Population, Military Strength and Financial Stability of the kingdom.

3 Research

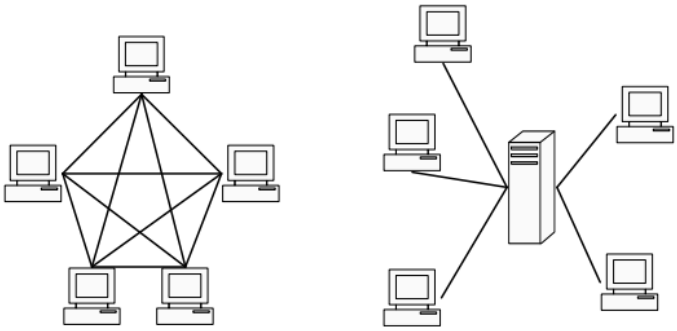
Asynchronous multiplayer is defined by Ian Bogost[1] with four primary principles.

1. *Asynchronous play supports multiple players playing in sequence, not in tandem*
2. *Asynchronous play requires some kind of persistent state which all players affect, and which in turn affects all players*
3. *Breaks between players are the organizing principle of asynchronous play*
4. *Asynchronous play need not be the defining characteristic of a game*

Bogost goes on to list a multitude of both physical and digital games which have a asynchronous multiplayer element to them, many of which, such as Diplomacy[5], can also be played synchronously, or live, amongst its players.

There are various types of networked architecture within computer science, however, the main two are peer-to-peer networks and client-server networks.

Peer-to-peer is defined by Schollmeier[2] as a network where "the participants share a part of their own hardware resources [which are] necessary to provide



(a) Peer-to-Peer (b) Client-Server

Figure 1: Chia-chun Hsu 2003. Topology for Multiplayer Online Game system. [digital]

the service and content ... without passing [through] intermediary entities." The popular torrent protocol is based on this principle.

Peer-to-peer is then further split into two classifications by Schollmeier; "Pure" and "Hybrid". Pure peer-to-peer is where "any single, arbitrary chosen [peer] can be removed from the network without [it] sufffering any loss of network service." Hybrid peer-to-peer is where "a central entity is necessary to provide parts of the offered network services."

Schollmeier defines Client-Server network as a server where the client and server are two distinct nodes where "a client only requests content" and "the server is the only ... provider of content."

Within a video games context, both peer-to-peer and client-server networks are utilised. Hsu compares both systems[3] with six characteristics; Scalability, Delay, Robustness, Consistency, Cheat-proof and Easy to charge. They conclude that peer-to-peer is good for Robustness, Scalability and Delay, but poor for Consistency, Cheat-proof and Easy to charge, whereas, Client-Server is the opposite, being poor for Robustness, Scalability and Delay, but good for Consistency, Cheat-proof and Easy to charge.

4 System

For War and Legacy the gameplay revolves around asynchronous interaction between players. This is difficult to achieve in a peer-to-peer networked system as players within War and Legacy never directly at the same time. As such, for this type of project, a client-server network solution works better as you can ensure consistency between players.

5 Conclusion

References

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Games

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