Chapter 14
Exploiting P2P in New Media Distribution

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ABSTRACT

P2P is currently the most contentious area of Interactive Digital Media on the Internet. It continues to grow in popularity at a phenomenal rate while media producers are seemingly stuck in a cycle of who needs to be prosecuted to prevent this form of piracy, and the majority feel that content should be paid for either to own or to rent with a Digital Rights Management time bomb. An alternative method of paying for the licence to download is presented by two self styled media futurists, and they conclude that it is easier for the industry to adapt to a market based on something that continues to feel like free rather than trying to enforce a model that is clearly not working at the moment and brands hundreds of millions of Internet users criminals. One proposal is that a US$5 monthly licence would produce an income of US$3 billion to the music industry. We explore how this could be extended to the digital media.

INTRODUCTION

Although broadcasting media has been around for a long time, however, each new technology has seemed to disrupt the previous one to some extent. Television disrupted radio and cinema, colour TV disrupted black and white. New media is currently disrupting traditional broadcasting. As the technology of new media improves the extent of this disruption and means of exploiting it for profit needs to be considered.

At any given time millions of users are using some type of Peer to Peer (P2P) streaming technology to deliver live multimedia content. Existing technologies allow end users to peer-exchange blocks which reduce the burden on the servers of content providers; this has made it possible to distribute legal multimedia of an 'acceptable'

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quality to end users. P2P media streaming typically relies on a mesh overlay topology which has been demonstrated to be more successful than tree-based technologies. Current P2P technologies use simple protocols that form a mesh by sharing lists of peers in order to locate the data (Chuan, Baochun, & Shuqiao, 2008). Overlay multicasting, often referred to as peer-casting, alleviates many of these performance limitations through decentralising the multicasting method as well as facilitating on-demand content delivery. Multicasting is problematic by its very nature and suffers from huge overheads such as duplicate data transfers, uneven load distribution and the unreliability of end hosts.

PeerCast, a proposed implementation of overlay multicasting, is designed to overcome this by being self-configuring, efficient and failure-resistant. Jianjun et al (2008) proposed that this network should have a "Internet-landmark signature technique to cluster the end hosts of the overlay network", be capacity aware to balance the demands of multicasting and they also proposed a dynamic passive replication scheme to overcome the reliability issues of peers. Peer-casting allows chunks to be streamed. With broadband speeds and available bandwidth increasing the number of customers who can download chunks with sufficient speed is rapidly increasing, which makes live high definition media broadcasting a realistic proposition. Although it has already been implemented on a small scale, current bandwidth limitations have meant that on slower connections near-live streaming is not yet possible (Jianjun et al., 2008). Peer-casting refers to multicasting a data stream through P2P technology without central server for distribution.

Currently there are many available architectural designs of P2P systems used for content distribution (Tsoumakos & Roussopoulos, 2003). Content distribution can be done either in distributed way like Gnutella, the "pure P2P system", or in a server mediated way like Napster, Bit Torrent, the "Hybrid P2P", a hybrid client/server model or even based on a pure client/server model like the World Wide Web (Erman, Ilie, & Popescu, 2005). All P2P applications have attracted great attention and applications like BitTorrent, Skype and PPlive had already become part of lifestyle (Li, 2008). The successes of those popular P2P applications have attracted more and more people to develop and invest in P2P which is the main reason behind developments in the technology.

Legal Constraints to Profit from P2P

Since the inception of P2P the issue of copyright has always been the most challenging obstacle for exploiting the technology[1]. A wave of litigation in response to booming global intellectual property rights has been triggered by the prosperity of the Internet; this is accelerated by the growth in popularity of Web 2.0 technologies substantially worsening the problem. P2P in its current implementation provides the biggest platform for distributing pirated media and other illegal content. For instance with P2P online TV most of the distributed content is done without the permission of content owner and often breaches the local laws of some countries as well as the content often being restricted in certain regions (ManyWorlds, 2002).

Generating revenue from digital media distributed through the Internet is a critical growth area for Interactive Digital Media. There are two possible options for generating income through *pay for content* or the proposed model of *pay for attention*. Pay for content uses a traditional model of renting content for a limited period of time while pay for attention sets a fixed fee for unlimited content downloading (Leonhard, 2009). Exploiting P2P for profit is a controversial area with many media producers currently favouring a pay for content model which would parallel the existing traditional media distribution model where customers pay to purchase a physical object such as a video cassette or DVD or pay to rent content from a video rental shop,