



Software, Music and Movie Piracy Trends

## **UDPiCore: Methodology and Framework for Data Security of Recording Media**

*Enabling Protection of Data Storage, Optical Media and Software against Piracy and Copyright Infringement.*

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January 2007

### *Abstract*

In 2005 for every two dollars of legitimately purchased PC software, one dollar's worth was obtained illegally, according to the Third Annual BSA and IDC Global Software Piracy Study. Additionally, the IFPI lists many forms of music piracy such as CD-R piracy, pressed CD piracy, Internet piracy and new forms of digital piracy such as LAN file sharing, digital stream ripping and mobile piracy. Piracy has been cited as the largest threat to the United States motion picture industry in an analysis prepared by LEK for the Motion Picture Association. Adding to the fire of the results of these reports, studies and statistics analyzing the negative impacts of piracy, two United Kingdom researchers have found that anti-piracy campaign messages have little impact on people's attitudes and many people view purchasing or downloading illegal content as "normal leisure practices".<sup>1</sup>

The UDPiCore patented technology targets data storage, software, optical disc as well as other forms of piracy, combining a secure microprocessor core with legitimately purchased software, optical discs and data storage medium. Referencing the UDPi white paper, *UDPiCore: Method and System for Microprocessor Data Security*, security is woven into the fabric of the processor, enabling security on a per-byte basis and extending advanced security measures for data storage applications.

UDPi's anti-piracy technology is unique from software-based solutions that have not proven to be effective in the long-term prevention of physical as well as other forms of piracy. UDPi has developed a method of building security into the hardware or reading device and uniting the components of that hardware with software in a secure system. This is a novel and effective approach to combating piracy that is not offered by any other company.

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<sup>1</sup> Hermida, Alfred. *Software Piracy 'Seen as Normal'*. BBC News, 2005.  
<http://news.bbc.co.uk/1/hi/technology/4122624.stm>



## *Problem*

According to IDC estimates, \$300 billion will be spent on PC software globally over the next four years by businesses and consumers. With the current market growth and piracy rates for each country, the IDC estimates that in the same four years, almost \$200 billion worth of PC software will be pirated.<sup>2</sup> In the same study, the top five countries with the highest piracy rates are listed as Vietnam (90%), Zimbabwe (90%), Indonesia (87%), China (86%) and Pakistan (86%). The top five countries with the greatest dollar value of pirated software are listed as the United States, China, France, Germany and the United Kingdom. The United States actually has one of the lowest piracy rates of all countries at 21%. Since the U.S. market is so large, a piracy rate of 21% amounts to enormous financial losses. Canada and the European Union show similar trends to the United States, with relatively low software piracy rates, but having substantial dollar losses due to the size of their markets.<sup>2</sup>

Software piracy has negative economic consequences, with competition of pirated software from abroad crippling local industries. Lost jobs and tax revenues are also consequences of pirated software. In the December 2005 BSA and IDC study on the economic benefits of reducing piracy, the study concluded that a 10 percentage point reduction over four years would amount to more than 2.4 million new jobs and almost \$70 billion in tax revenues to worldwide local governments.<sup>2</sup> However, the increased availability of pirated software over Internet and peer-to-peer (P2P) networks is increasing the pressure on piracy rates, and IDC predicts by the end of the year the number of Internet users will be greater than one billion, with emerging markets being the fastest-growing Internet populations.<sup>2</sup>

The music industry has great concerns over the estimated trade of pirate discs being worth US\$4.5 billion globally in 2005. Additionally, in 2005 the IFPI estimates almost 20 billion tracks were illegally swapped or downloaded on the Internet.<sup>3</sup>

According to the Recording Industry 2006 Piracy Report, effectively titled *Protecting Creativity in Music*, physical piracy shows no signs of abating, with more than one in three of all discs purchased around the globe thought to be an illegal copy, amounting to 1.2 billion pirate CDs in total. In 30 markets around the world, sales of pirated CDs topped sales of legitimate CDs, with the majority of pirated discs being CD-Rs copied on efficient burner machines in small commercial labs. The IFPI estimates that US\$4.5 billion is the value of pirate product in 2005.<sup>3</sup>

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<sup>2</sup> Third Annual BSA and IDC Global Software Piracy Study. May 2006.

<sup>3</sup>The Recording Industry 2006 Piracy Report. <http://www.ifpi.org/content/library/piracy-report2006.pdf>



Despite taking action in the form of providing new legal services, enforcement, education and even forensic laboratory techniques to trace pirated productions back to their source; piracy has diversified into many forms and continues to thrive. The IFPI lists these forms of piracy; CD-R piracy, which is the dominant “fake disc” format, pressed CD piracy (manufacturing lines), Internet piracy, which increases the ease of pre-release piracy, and new forms of digital piracy. Such new forms include *Local Area Network (LAN) file-sharing*, in which users are connected via a local area network, such as a university campus; *digital stream ripping*, in which streamed music is converted into a stored file and *mobile music piracy*, with mobile phones being used to access free music through Bluetooth transfers that can transfer files from phone-to-phone.<sup>3</sup>

Some major findings from the Motion Picture Association’s analysis prepared by LEK, *The Cost of Movie Piracy*, show that in 2005, major U.S. motion picture studios lost \$6.1 billion to piracy worldwide, with 80 percent of these losses from overseas piracy. Additionally, 62 percent of the total \$6.1 billion loss was from piracy of hard goods such as DVDs, and 38 percent was from Internet piracy. The worldwide motion picture industry lost an estimated \$18.2 billion in 2005, according to the analysis, with piracy rates being highest in China (90%), Russia (79%) and Thailand (79%).<sup>4</sup>

Software solutions have been attempted to stop the diversifying problem of piracy and resulting revenue losses, but these solutions are not implemented for long before they are figured out by prospective copiers and the software, music, movie or other content is illegally copied and set for mass distribution.

One example of a conventional protection measure is to add a secure sector to the optical disc that cannot be copied by normal CD/DVD writers, with the secure sector containing information that enables the disc to be read. Thus, unless the secure sector is also copied to the new disc, the new disc cannot be read. The problem with this protection technique is that it is only effective as long as the secure sector is not rewritable by available CD or DVD copiers. Similar problems may occur when protecting computer program instructions stored on data storage media.

Data is known to be stored on recording media using data delimiters to identify sectors and blocks of data within which the payload data are stored. These sectors and blocks use the data delimiters in order to indicate to the reading device the start and end of a block or sector, with the delimiters essentially acting as markers as to where the data starts and ends. The problem arises if only the payload data on the disc is encrypted because a prospective copier can use the data delimiters to readily identify the location of the payload data, which may assist the copier to decrypt this information, overriding any encryption techniques used to protect the disc’s content.

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<sup>3</sup> The Recording Industry 2006 Piracy Report. <http://www.ifpi.org/content/library/piracy-report2006.pdf>

<sup>4</sup> The Cost of Movie Piracy: an analysis prepared by LEK for the Motion Picture Association. [http://www.mpaa.org/2006\\_05\\_03leksumm.pdf](http://www.mpaa.org/2006_05_03leksumm.pdf)



## *How the UDPiCore Technology Solves the Problem*

The application of the UDPiCore method can prevent revenue losses due to the various forms of piracy and the illegal mass distribution of copyrighted content. This method importantly combines a hardware element to security, making security inherent in the data storage medium such as optical media and the reading device. The UDPiCore creates a unique identity for each disc, which is then matched to a unique reading device, solving problems associated with rewritable CD or DVD copiers, which can create problems for data recording mediums such as optical discs that are protected with a secure sector that can be copied once the secure sector is rewritable by such CD or DVD copiers. The UDPiCore encodes all data elements, preventing prospective copiers from determining where the protected data starts and ends.

With the UDPiCore hard-wired security incorporated into portable devices such as MP3 players, software forms of digital rights management (DRM) can be interoperable, potentially increasing competition and innovation for digital content providers and portable device manufacturers.

## *Conclusion*

The UDPiCore approach to security combines hardware and software elements, creating unique reading devices and data storage mediums such as optical media, forming an encoded stream of data from the reading device (including the reading device), to the recording medium (including the recording medium). This method does not prevent users from making legitimate back-up copies of optical discs or other recording mediums, but rather prevents the use of copyrighted data on unauthorized machines as well as illegal mass distribution of copyrighted materials through advanced encoding and decoding processes, with co-operation between reading device and recording medium. The UDPiCore method of security is an efficient and effective means of reducing diverse forms of piracy and protecting revenue.

Contact Universal Data Protection Corporation for any questions you have about this document.

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