

DRM, Copyright, and Fair Use Regulations

Mehmet Berk Gürçay

Introduction

Copyright and DRM have been an important discussion for digital media providers since personal computers arise. Creators and vendors have been trying to find the best way to offer their digital product within copyright and consumer satisfaction. This situation is especially critical for music, movie and gaming industries since these products can be easily copied & shared, and generate most of the owners' revenue.

1. About DRM

Digital rights management (DRM) is an approach to protect the digital copyrighted works. It aims to control user's abilities, for instance, in many cases, users are not allowed to copy the products they own because of copyright restriction that is enforced by DRM. This methodology has created a significant amount of contradictive discussion over the years. Each country has their perspective of copyright protection, and since the Internet is more of a universal community, the debate remained unsolved over the years. [1] [2]

2. History of DRM

DRM has applied in many different contexts. The focus on the DRM providers to prevent copyrighted data to be copied and distributed without permission of the creator of content. They found several methods to achieve this goal over the decades. However, each one of them has their weaknesses and controversial result among consumer satisfaction. [2]

a) Limited install activations, and Product Keys [3]

Restriction on the ability to install software for multiple times on several machines is one of the well-known methods of the DRM providers. The aim is to prevent to share the content over other individuals. Effects of it on users differs with the implementation if the DRM. It limits the number of computers one can have, meanwhile, it may also affect the users as they upgrade their hardware, or change their operating system configurations.

This measure is approach mainly by two different ways. It can be realized on shared medium of the product such as physical CDs of the content. The disk can monitor the installation occurrences and count the number of installs, then, take action according to the implemented policy. DRM providers take one step further and encrypt partially or entirely the data on the disk, and decrypt as the rules allow. The other

approach for these restrictions is to hand over product license keys to the users and apply access control on this level.

Product keys and installation limits are a classic, and popular way to protect copyrights of the content, and most likely enforced offline. So, it is very inviting for people who want to abuse copyrights and gain unauthorized benefit. The implementation of such technique can be cracked or bypassed in a reasonable time.

Video game publishers have applied several unique ways to implement product keys for DRM. Many of them aim to enhance user experience to surpass the disadvantages that are created by the DRM. For instance, I encountered interesting puzzles to reveal the necessary key to unlock a particular part of the game, or simply asking a randomly chosen word from the physical manual. It makes attackers not only to distribute the data but also share the physical content that is delivered with the original product. The approach can relate with the authentication with something we have. This method was dependent on the fact that physically replicating the information that comes with the product, even in some cases, publishers tried to print these documents in predetermined color themes to make it harder to be replicated by other. However, with the development of photocopy, scanner, and camera technologies, this approach is lost its popularity rapidly.

b) Persistent online authentication [1]

The requirement of persistent internet connection with the content provider is a relatively new approach for DRM. However, it does not only enforce users to have a reliable internet connection, but it also creates suspicion among consumers since the method requires constant monitoring of the users. On the other hand, this measure enhances the copyright protection significantly, since it requires a more sophisticated approach to bypass the DRM.

Persistent online authentication used for video games and streaming movies-songs. Similar to installation limit, this approach also restricts users to authenticate themselves only on a limited number of machines simultaneously.

This method can be used with the very strict scheme, and when the connection is lost with the server, it could completely block the access of content. Meanwhile, some providers allow users a limited period to have a window for any offline usage.¹

¹ For instance, Electronic arts tried to enforce strict connection rules for SimCity to limit offline players access, even for single player game mod
[Usher, William (5 March 2013). "SimCity Now Available; Always-On DRM Causes Major Launch Day Issues". *Cinema Blend*. Retrieved 5 March 2013.]

c) Arcade Machines [4]

Arcade machines are an interesting topic of DRM. Content publishers have control over both software and hardware, so, they developed several unique approaches to the copyright protection. When first arcade machines were released, it was a simple process to replicate one of them. Just duplicating the ROM chip inside the device, and creating correct hardware configuration were giving people to make a copy of the machine without permission of the original creator.

Publishers began with encryption of the data in machines and inserted a dedicated encryption-decryption hardware chip on the motherboard of the machines. However, it bypassed by the other people in time, so publishers tried to find more sophisticated techniques to solve the issue.

Firstly, Capcom and Sega decided to place a custom chip that calculates some fundamental parts of the game. There were several chips to crack, and each one of them was hard to break. In time, crackers found vulnerabilities, and they became useless. After this technique, placing battery-backed RAMs were applied to machines. It was great in theory since it was hard to copy randomly placed data from a volatile memory and then use it on a different device. However, it had a big flaw. As the batteries died, the arcade owners lost their access to the machines. So, this approach had a short lifespan.

And lastly, arcade machines shift into persistent online authentication method for DRM purpose.

3. Cost of DRM

There are two sides for cost analysis of current DRM implementation. In copyright holders' perspective, they should provide support for DRM, and put extra work into their product. Also, some DRM handles control mechanism on the library level, so the standard functions that are used in software implementation become altered by DRM companies such as input-output operations for files. If these alterations are not handled well by DRM providers, there is the possibility of unknown bugs or unreliable actions, and it makes developers job harder. Also, copyright holders need to pay extra money to have such protection over their content. DRM dealings require a serious financial cost analysis for the publisher, since DRMs still does not provide complete protection, and can be cracked in a reasonable time. The CEO of Projeckt Red, Marcin Iwinski, addressed this situation. He explained their usage of DRM on one of their game as unnecessary complications and said that the game was cracked in just two hours. [5] So, it was just an extra burden for the developers, both as financial, and effort based.

If we move to the perspective of people who pay for the copyrighted content to own it, DRM restrains people to have full control over the product they paid. Basically, companies that enforce DRM expresses that “the content you are accessing is mine, and I determine the rules about how you use them.” This idea of restricting users with some rules creates many controversies and affects consumer satisfaction and financials. For instance, if a software lets you use it on just one computer, you will lose access to it when you change your computer. In another case, if a media restricts users to play it only with a disc, and prohibits the replication of the disk when the disk got damaged or gone bad over time, owner of the disk will lose his/her rights over content that he paid.

4. Fair Use Regulations and DRM

Fair use is, as US Copyright office expressed, a legal regulation that protects freedom of expression by allowing the unlicensed use of copyright-protected contents in certain conditions. [6] Consideration of an act as in boundaries of fair use rights, is accomplished by the four-factor test. ² [2]

Unfortunately, the four-factor test is open to importation, so, fair use cannot be defined precisely. It creates an inevitable frustration among DRM vendors and their users. For instance, financial effects of an act can be discussed in many different perspectives. If you share your newspaper with your neighbor, in which limits the action is considered within fair use regulations? How many times can you share your newspaper so that you will not create a disadvantage for authors? Arguments like this create critical discussions on DRM policies. [2]

In another real-world example, in 2009, Amazon remotely deleted George Orwell’s Animal Farm, and 1984 e-Books from Kindle devices, and paid refunds to the owners of e-Books. Amazon defends themselves by connecting the action to piracy and, stated that one of the copyright holders notified them about unauthorized use of the e-Books, so they decided to delete them from every device to eliminate such problem. This action of the Amazon created a lot of discussions at the time. In this case that can be seen DRM policies have affected legitimate people because of fair use violation of others. [7] In a similar sense, we can relate Amazon example to persistent online authentication enforcement. Publishers encounter copyright abuse on offline context, and cannot address the problem remotely and efficiently, so that, they take action that also affects legitimate consumers as they prohibit the offline availability of the content, and limit consumer ownership over purchased product.

² - Whether the purpose of use is commercial, or non-commercial, such as nonprofit educational use.
- Nature of copyrighted work
- The amount and substantiality of the portion of the work used
- Effect of the use upon the potential market for or value of the copyrighted work

5. Conclusion

Meanwhile policies and extend of current DRM solutions is contradictive, this kind of system is inevitable for application of copyright on digital media. DRM and copyright protection have developed over many years and passed through different approaches. By examining the history of it, we can state that It is most likely that there will be other plans for DRM. However, independent from the approach, it is clearly seen over decades that abuse and overuse of its opportunities and creates harsh consequences for creators, publishers, and consumers.

6. References

1. Samuelson, Pamela. "DRM {and, or, vs.} the law." *Communications of the ACM* 46.4 (2003): 41-45.
2. Von Lohmann, Fred. "Fair use and digital rights management: preliminary thoughts on the (irreconcilable?) tension between them." *Computers, Freedom & Privacy*. Vol. 3. 2002.
3. Basinger, Clint. (2012, Oct. 26). History of DRM & Copy Protection in Computer Games. [YouTube video]. Accessed 2017, May
Available: <https://www.youtube.com/watch?v=HjEbpMgiL7U>
4. Basinger, Clint. (2013, August 8). Arcade Game Copy Protection & DRM. [YouTube video]. Accessed 2017, May
Available: https://www.youtube.com/watch?v=uuswuoPPr_0
5. B. Stone, "Amazon Erases Orwell Books From Kindle," *New York Times*, 2009.
Available: http://www.nytimes.com/2009/07/18/technology/companies/18amazon.html?_r=0
6. "More Information on Fair Use", Copyright.gov, 2017. [Online]. Available: <https://www.copyright.gov/fair-use/more-info.html>. [Accessed: 14- May- 2017].
7. D. Mulligan, "DIGITAL RIGHTS MANAGEMENT AND FAIR USE BY DESIGN," *Communications of the ACM*, vol. 46, no. 4, pp. 31-33, 2003.