

AMERICAN UNIVERSITY OF BEIRUT

WARS OF THE WAREZ; THE NEVER-ENDING BATTLE
FOR RECOGNITION AND SOCIAL CAPITAL
IN THE DENOVO WAREWIND

by
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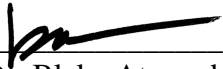
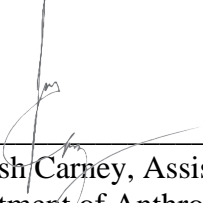

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ABSTRACT OF THE THESIS OF

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There exists an online community known as the Warez Scene, which focuses on downloading, cracking, and distributing paid licensed software/games for free in the form of piracy. These pirates, as they call themselves, have one goal: to remove the digital protection that companies have placed in these games. Such digital protections, known as DRMs, exist to make sure a digital product is accessed and used via legal and legitimate means. However, crackers within the scene spend days, even weeks working to infiltrate this protection system, which manifests in different ways within each digital product. They do this work to release said digital product for free and thus secure no financial gain.

In this thesis, I ponder the question, why? Why do crackers, who are sometimes teams of people, work around the clock to infiltrate a DRM and release the cracked software to the public? Through netnography I narrowed it down to three reasons, each with a dedicated chapter: (1) Aspiration and Competition, this is where I look into one part of motivation and how competition drives these groups to crack bigger and harder games. (2) Creativity and Problem Solving, in this Chapter I show how cracking is considered an art. I show different difficulty levels of cracking and how these DRM companies find new ways to protect their game, and in turn, how these crackers find ways to infiltrate this protection. And finally (3) the Aesthetics of the Warez Scene, where I look into the warez scene as a whole through the lens of art. I look at where the scene is situated online and how its artistic representation helps fuel these crackers to take part in a “fantasy” online world.

It is important that we look into this to find behavioral patterns to figure out how precarious labor pertains to not only legal forms of labor, but underground methods as well. Moreover, this thesis intends to expand on the existing scholarship that exists on the warez scene.

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GLOSSARY

ASCII/ANSI – An art method used in the Warez Scene’s NFO files that consists of letters and numbers, dashes, and dots to create imagery in text-based software.

Conspiracy – An Italian cracking group that focuses on cracking Denuvo. One of the best Denuvo crackers, currently retired.

Cracking – The process of infiltrating a DRM-protected software and removing/tricking it.

Cracktros – Intros crackers place at the launch of their released cracked game, that states the name of the group who cracked it and any other necessary information.

Denuvo – The primary and toughest DRM/anti-tamper technology used by AAA developers to protect their game from piracy at launch.

DRM – Digital Rights Managements; pieces of code that protect a game from being pirated or installed illegally.

EMPRESS – The only active Denuvo cracker in the scene; considered to be the most talented cracker of all time due to her fast and reliable hacks for the most Recent AAA games.

Greetz – a section within the NFO where release groups ‘greet’ other release groups and tend to do all their talking; sometimes dissing other release groups, this tends to be where all the fun happens.

Jumps – A method in cracking software whereby you trick the program to ‘jump’ certain lines of security code to access a protected software; commonly used in older protections.

NFO – Short for information, a file released with every crack in the scene that contains information about how to mount the crack within a game, what the game is about, the genre, and any other necessary information the downloader needs. Think of it as a helpful pamphlet.

Nuke – The process of removing a faulty crack from within the scene; normally nuke groups beta test scene releases to make sure they are up to scene standards.

Obfuscation – A tactic used by Denuvo to introduce bloatware into a video game’s code that shrouds sensitive and vulnerable codes that crackers target in bloatware, making it harder to find.

Release groups – Scene groups that consists of couriers, crackers, beta testers, re-packers and distributors that focus on bypassing DRMs from protected software.

Re-packers – Online websites that pack a crack for a game within the game itself while removing unnecessary data like different languages and zipping the file to make the game size smaller and easily downloadable; considered the face of the scene as majority of people download their cracks from re-pack sites due to their accessibility.

SteamPunks – An online Denuvo cracking group that utilized keygens to bypass Denuvo protection; currently retired.

The Demo Scene – A subsection of the warez scene where programmers, designers and musicians come together to create demonstrations/simulations done on the computer through 3D modeling graphic design and original compositions normally within the limit of 64 kb.

Virtualization – Another method used by Denuvo where creating a virtual computer within one's computer in which the game is launched and played in. This creates a barrier between the files on the actual computer versus the files within the virtual computer, making it tougher for hackers to infiltrate.

Warez Scene – An underground online community that focuses on the cracking and distribution of pay-gated software, primarily video games.

CHAPTER I

INTRODUCTION

On the internet there exists an uncountable number of online communities. Some foster fandoms; some focus on medicine and biology; others take shape around the dismantlement, desolation, and destruction of video game protection. Enter the Warez Scene, an underground online community whose goal is to download, crack, and release software protected by any sort of security technology. Members of this community stop at nothing to make sure almost every protected software is cracked and released free of charge for the public to enjoy. Such a community is called an “underground” community due to the nature of their labor, which is considered illegal. Their practices are prohibited and punishable by law and a good many individuals from this scene have been arrested.(for example, a Bulgarian Cracker by the name of Voksi, in 2018 reported on Kotaku, 2018)

Despite its illegal nature, crackers find interest in infiltrating and disabling DRMs within video games. The scene had been cracking video games constantly for 50- 60 years (Reunanen., Wasiak, & Botz, 2015) with consistent and reliable releases of DRM (Digital Rights Management) removals. First and foremost, what are DRMs? DRMs is the “software security”, they are a type of technology that has been around since the 1970s that protects licensed software from piracy/cracking by running checks in the software code to verify its legitimacy (Reunanen., Wasiak, & Botz, 2015). The scene would work out how to crack an unsuspecting video game and distribute it to the public. Naturally, video game companies started to notice that this was a problem and a

loss of revenue in their companies, so something needed to be done about the pandemic of video game cracks (Parkin, 2016).

Why would one put themselves at risk of getting caught by the law enforcement with no financial benefit to be had? This is where the idea of personal aspiration and desire trumps the ideal capitalist gain. In the warez scene, there exists a standard, and there is almost no financial gain to distributing cracked games to consumers. So, the question remains; why would one risk their social and legal standing to voluntarily partake in a system that requires many hours, sometimes up to 40 hours per week (Paul 2005; Goode and Cruise 2006), within the scene just to produce cracks that can sometimes be months after the official release, where the initial hype of the game would have died down?

I answer this through the theory of precarious labor to show how, one, video game creaking creates social capital through competition and aspirational goals. Two, the drive these crackers find is through the creativity they need to muster up in order take on new challenges that official DRM-protected releases set for them. Three, the aesthetics and ecosystem of the scene that sets the tone and mood that these release groups thrive in, we will soon outline in chapter 4 that the scene is much bigger than just releasing cracked video games.

The technological solution to the rising instances of video-game cracking was Denuvo. Founded in 2013 by SONY Digital Audio Disc Corporation as a DRM cloak or anti-tamper technology that shields existing DRMs of video game releases by obfuscating and virtualizing the code of the game—a process I describe in more detail in Chapter 2. Normally, DRMs come in the shape of serial keys acquired upon purchase, or online video game distributors platforms such as Steam and EpicGames

use their own DRMs to protect games sold on their websites. But Denuvo is different because it was made solely to prevent crackers from finding vulnerable and sensitive game codes normally targeted in the cracking process.

To test this newly developed technology, Sony first incorporated Denuvo protection in Sony's *FIFA 15*, making the game files practically impossible to locate or alter. Upon seeing its success, "FIFA 15, Lord of the Fallen and Dragon Age: Inquisition all utilized Denuvo's Anti-Tamper Tech, and all three remained uncracked for weeks" (Purchase, 2014). Other games started to utilize this DRM/anti-tamper technology in their releases, and months would go by without a crack. In a world where users would receive cracks within days of an official release, they were now waiting months to no avail. However, this changed in December of 2014, a Chinese warez release group known as 3DM successfully bypassed Denuvo in the game *Dragon Age: Inquisition*. Although the release was buggy and unstable., it nevertheless proved that Denuvo was not completely impenetrable.

In the wake of 3DMs semi-successful crack a new group emerged within the scene as if calling to the challenge that Denuvo instigated. Enter Conspiracy, who successfully released the first-ever stable crack for a Denuvo protected game: *Lord of The Fallen* in July 2015. The game had lasted 271 days without a crack, something unheard of within the scene. Soon after, ConspiraIncy proceeded to crack *Batman: Arkham Knight*, another Denuvo-protected game, reinstilling hope to the scene after the Denuvo setback. Cracking release after release, Conspiracy started to build a very reputable resume for themselves and instantly shot to the number one most reliable and consistent group within the scene.

While Conspiracy had made their statement within the scene and set a president on the quality of Denuvo cracks, A new and faster method to crack Denuvo found its way into the scene. Through the mist, in 2017, SteamPunks enter the Denuvo-cracking fray, adopting a new method of bypassing Denuvo DRMs by using keygens. Keygens are generated keys, usually a string of letters and numbers used to determine the legitimacy of a software. SteamPunks came up with their own keygens that bypass Denuvo checks and determines the product as a legitimate copy. With this system, SteamPunks were able to crack games at a much faster and reliable rate. For example, they cracked *Tekken 7* just four days after its release; something that had not been done ever since Denuvo's introduction. At the same time, Conspiracy came out with a crack of their own for *Constructor* just 19 days since its official launch; reminding the scene of their experience and relevancy in their Denuvo-cracking capabilities, and thus the competition ensued.

This duality of these two groups created the essence of competition that the scene is known to stand on. SteamPunks released a keygen crack for *Ghost Recon Wildlands*. Soon after, the release was nuked for being defective. 'Nuke' is a term used within the scene to label defective and unreliable releases as un-downloadable since their cracks either break scene standards or do not function properly. Consequently, Conspiracy filled the empty void with a proper release of their own. Note that where SteamPunks bypasses the Denuvo protection, Conspiracy utilized more complicated methods. Nevertheless, SteamPunks stamped their image within the scene due to their cracks not requiring Denuvo removal, they were able to release Denuvo cracks at a fast and consistent rate, even at one point they were able to release ten Denuvo-protected games in one month; a feat never thought possible.

To counter this, Denuvo released version 4.8 of their product where they added extra layers of security. However, this was proven useless as the first game to feature this version, *Assassin's Creed: Origins*, was cracked by Conspiracy months after. As of now, SteamPunks and Conspiracy are no longer as active; neither having released a crack for many years. Since then, new groups have picked up the Denuvo-cracking mantle such as EMPRESS and CODEX.

While CODEX has since retired due to the lack of competition and thrill withing the current scene, (CODEX retirement NFO, 2022) EMPRESS has taken center stage as the only Denuvo cracker currently active. EMPRESS is considered one of the best crackers the scene has ever seen due to her ability to crack the latest and most updated version of Denuvo. For example, *Hogwarts legacy* was released on February 10th, 2023, using Denuvo v17 as its protection. It is reputed that this version of Denuvo was created specifically to battle EMPRESS who had been able to bypass all its security. As EMPRESS claimed in her Telegram group, "Denuvo has created thousands of new obstacles for me in a fresh Denuvo version [v17]. They trying to block me in countless ways, and they are even going against the limitations of hardware in the process" To Denuvo's dismay, EMPRESS cracked it in only a few weeks, on February 23rd, 2023. This quick turnover of a Denuvo-protected game had become almost unimaginable in the scene.

All in all, in this historic anecdote, we can see the rise in interest within the warez scene. But what continues this drive to crack Denuvo protected video games? I argue that even throughout the years, Denuvo has been at a constant war with these release groups due to competition within the scene, the creative and problem-solving

skills that these release groups need to develop to crack these games, and the part that they play within a scene structure as a whole.

A. Welcome to the Scene

This section looks at where the scene is now, and how this scene has been situated within the current internet and structural sphere. Welcome to the warez scene, a relatively closed environment with its own rules, customs, systems, and media (Paul 2005; Rehn 2003). The scene has been active since the beginning of software development and with technological growth has only gotten better, more expansive, and more complex. The complexity of the scene can be seen in cracking groups such as CODEX, who utilize supply chain management systems to reliably crack and release video games with as few flaws as possible (Basamanowicz and Bouchard, 2011).

	Administrative Function <i>Decision Making</i> (Leader, Senior Members, and Council)				
Step	1) Supply →	2) Crack (⇒)	3) Test ←	4) Package →	5) Distribute →
Aim	Obtain commercial content by technical skill, position, or legal purchase	Strip the copyright protection features	Ensure content is fully functional with copyright protections removed	Package content to scene standards	Distribute content to appropriate sites
(Role) Requirement	(Supplier) Access to new content	(Cracker) Highly specialized skills	(Tester) Familiarity with content	(Packager) Familiarity with warez scene standards	(Site Operator/Administrator and Couriers) Possible specialism in hardware and/or high bandwidth capacity
Visibility	Yes	No	No	No	Yes

Table 1. Supply Chain (Basamanowicz and Bouchard, 2011)

In this supply chain, there are a multitude of different jobs taking place to crack and distribute DRM-protected video games. It is important to these groups to release

reliable cracks as their reputation depends on them, if such a group constantly releases buggy cracks and is determined as unreliable, they can be nuked from the scene, never to upload a crack again.

As I demonstrate in this thesis, this system relies on reputation or social capital. This is reflected in Rosalind Gill and Andy Pratt (2008) theory of precarious labor and Duff's (2015) aspirational labor in where one pursues labor without any financial/capital gain that could be considered unreliable, unregulated, and unimposed; rather they undergo this labor for any ego-related reasons or any aspirations one would have to achieve. Atwood's (2021) *Underground* focuses on individuals in the informal Iran-cassette distribution scene, where Omid mentioned his favorite thing about it is meeting new people and distributing informal cassettes among the masses, despite risking his legal status for it.

The Warez Scene is bigger than most think. The world of the Warez Scene is not just cracking software. When delving deeper, I found that the Warez scene was part of an even bigger entity, that included the nuke scene, groups that focus on beta testing and pushing cracked games to the limits to determine if they are worth staying within the scene or nuking. The Demo scene is a community of people that focuses on creating computer simulations and graphics to demonstrate their artistic capabilities. The ASCII/ANSI art scene, where they would create art for NFOs and logos through computer expressions like dots and dashes. This call comes together and paints the aesthetics of the Warez scene, all these scenes worked together to make cracked releases as pretty as possible.

The Warez Scene is a vast and complicated online world, release groups have multiple people working different jobs to make sure the best quality cracks are released

to the public. Within the Scene exists other, smaller communities that fill other niche rolls, like the Nuke scene, Demo scene and the ASCII/ANSI scene that all work together to shape the scene to how it is today.

As I will be delving deeper into them later, it is important to describe what the Nuke scene, Demo scene and the ASCII/ANSI scene is. As subsections in the Warez scene, Nuke scene works are quality assurance for the scene. Once a crack is released, they pressure the crack and check if it contains any harmful viruses that could harm computers. If they deem that a release does not hold up to the scene standards and rules, is it “nuked” (removed from) the scene. The Demo scene is a branch that looks at computer “demos”, that is, computer simulations, 3D designs, gaming demos all within a very small 64kb size limit. The aim is to create the most outrageous and creative demo while using the least amount of disk space. They were mostly used for cracktros (Intros crackers place at the launch of their released cracked game, that states the name of the group). Finally, ASCII/ANSI scene is a very art heavy scene that uses special computer characters like dots and dashes to create .nfos, logos and art for the warez scene. I explore this further in chapter 3.

B. Gaps in the Knowledge

We see through various research that scholars have attempted to iron out the complex system that is the warez scene, however, the majority of these scholarly works gloss over the actual content of the wares and unfortunately do not represent the creative labor needed and utilized to produces such releases.

Scholars studying the scene have produced a plethora of models and systems the warez community undertakes to keep a reliable flow of cracks and deliverables to the

consumers. To start off, He´ tu, Morselli and Leman-Langlois (2012) articulate the warez scene as a setting of organized activity with its own rules and regulations. They compete in a tournament-like setting where quality and quantity is judged and pitted against other releases in the scene, once a group releases a new cracked warez, it is considered a call to challenge for other groups to “answer the call”. They also mention that the scene as a strong moral sense that keeps its head held up high.

The structure of the scene is broken down into a supply chain and has been heavily researched and outlined. Basamanowicz and Bouchard (2011) present a supply chain in where suppliers, normally individuals within videogame developing studios, leak early releases of games to a group. The crackers break the DRM from the system and set it up of beta testing to ensure quality as their reputation relies on it, only after it is tested that it can be released to the public through peer-to-peer websites and BitTorrent where it is then distributed and repacked for the consumers convenience. Rehn (2004) links the warez scene to that of Mauss and Malinowski (1922) gift giving economy. He further explains that recognition is produced in “how efficiently one can be generous, the participants will expend much time and resources in order to secure releases.” In that groups supply and receive the recognition they desire, so in theory, what they are exchanging though this illegal software is honor.

I have chosen these scholarly works because it best outlines how the Warez Scene works. While majority of Warez Scene scholars have a very similar scene structure, Basamanowicz and Bouchard give the most understanding and thought-out structure, even providing a table on the supply chain (Table 1). Given that the scene is complicated and could get too confusing to understand, with a table neatly provided it helps to better visually represent the scene as a whole.

C. Methodology

I undertook multiple research methods to get to the bottom of the ‘why’ question. First, I examined .nfo files. Every release of a crack comes with a .nfo file (short for “information”) detailing relevant information about the crack, on how to install it, any further notes, and importantly, something the scene calls ‘Greetz’ (a play on greets). In these ‘greetz’, groups call out other groups, or rather ‘greet’ other groups, where they passive-aggressively acknowledge each other’s presence and continue to compete against each other. For example, CODEX always finishes off its .nfo file with “CODEX is currently looking for nothing but competition”.

Through netnography, I study both these NFOs and three online forums: (1) the subreddit known as r/CrackWatch, which will be my primary focus: (2) r/EMPRESSEvolution, where EMPRESS normally would update her audience on her latest cracks, although Reddit banned the subreddit, it still contains relevant information, and (3) r/Piracy. Through this method, which was developed by Robert Kozinets (2009) to gauge online audiences’ reactions for brand product releases, I compiled and gathered interview data from members and ex scene members. Also, on the free social behavior of individuals in these subreddits, by means of comments, posts, interactions to formulate labor structures and systems. Also, I compiled data on the creative aspect of cracking video games that other researchers have failed to mention. Additionally, these .nfo releases from the scene will be used to understand this competitive ecosystem that the scene is heavily dependent on.

Finally, a heavy part of this thesis relies on some interviews I conducted with individuals who were involved in the warez scene. In order to understand a more personal approach as to why one would undergo this labor and the creative input needed

to crack these games. I have interviewed three people that are relevant to my research, one is an anonymous cracker/ game developer who had dabbled in cracking video games and knows the basic structure of how to do it. Another is Carsten Cumbrowski, a former figurehead within the art scene, and the founder of an art group called SAC, who was very active in creating and cultivating the artistic side within the warez scene. And finally, Voksi, a former Denuvo cracker who played a big role in the anti-Denuvo movement and who eventually got arrested for his involvement within the scene.

It is important to mention that I chose to interview these individuals due to the difficult nature of finding Scene members. The Scene is all anonymous and everyone, especially crackers, are all secretive and do not share any personal information. So I had to rely on former scene members, who I was able to get in contact with, and agreed to an interview.

This thesis is split up into three different body paragraphs. Chapter 2 tackles the argument of how aspiration and competition are used as a drive to have these release groups compete in producing the fastest and most reliable cracks within the scene. The faster the cracks, the more social capital they gain. Chapter 3 looks at how creativity is used as a catalyst to have these crackers infiltrate and remove DRMs. Like a puzzle, DRMs are laced with certain high-end protections that are designed to make it extremely difficult to infiltrate and it is up to these crackers to solve them. Chapter 4 looks at the aesthetics of the scene where we will look at how these crackers brand themselves within the warez scene; and how this branding helps to situate them within a "fantasy" space that helps them feel special.

CHAPTER II

ASPIRATION AND COMPETITION

To tackle the first branch of three, we dive into the discourse of precarious labor as it attains to aspiration and competition. In this chapter, I will detail and look at how the scene is structured and motivated and what keeps it afloat, how motivation keeps its surfaced and how competition steers it, their drives, goals, ambitions and desires - the will to undergo labor as opposed to something leisurely to reach their target. I will also dive into some examples where competition changed the course and goal within the scene and how its effects have caused a ripple that still has an impact in the present. I will be drawing upon the works Grill and Pratt, plus He´tu, Morselli and Leman-Langlois to solidify my claims in theoretical frameworks.

A. They Who Dare to Aspire

In fact, it is this aspect of recognition that holds the scene afloat and still on going to this day. Simply put, the scene supplies a stable, and sturdy crack to a game that is normally pay-gated, and they are rewarded by the community thanking and praising them. The more difficult the game is to crack, the more elevated and recognized that group is within the scene. This system evokes Mauss’s model of the politics of reciprocation. As Alf Rehn (2004) claims, “On the scene, the participants compete about being the first to have supplied a functioning version, as all later versions are regarded as ‘dupes’ (duplicates) and are erased from the servers” (p. 39) He links the scene’s politics with that of the gift economy: the groups gift the community a free product and receive recognition for their efforts. For example, whenever

EMPRESS, a video game cracker, releases a cracked game, It normally dominates r/CrackWatch receiving thousands of upvotes, while groups like DARKSiDERS barely get any due to the nature of the games they crack.

To counter the declining video game cracking rate, EMPRESS – a Denuvo-oriented cracking individual - has built a new model for cracking Denuvo games that involves donations. In contrast to the aforementioned model adopted by Conspir4cy and Steampunks, due to their inactivity, EMPRESS has taken over and filled the empty Denuvo-cracking void by accepting donation requests to crack Denuvo protected games. What was previously avoided within the scene came to light as EMPRESS started accepting game requests if someone was to donate \$500 USD. Donations is not something new within the scene, but a request of this magnitude is unheard of. Nevertheless, EMPRESS has monopolized the video game cracking scene as every Denuvo game since 2021, other than one, was cracked by her. EMPRESS focuses solely on Denuvo-protected games while other release groups crack games with easier DRM's to crack or lesser-known games.

With this donation support, EMPRESS has taken on the identity of the Denuvo hunter/killer. She resents the companies that uses it. She hates all Denuvo-protected games as she believes such companies that enforce these protection systems are greedy, and intentionally bloat their games with DRMs to increase their own profit. “The reason why Ubisoft, EA and such companies never remove Denuvo from their games is only because they LOVE feeling *superior* and enjoy seeing you the customer as a PIG under their control or worse” (EMPRESS *Red Dead Redemption 2* NFO release, 2020). EMPRESS Talks about the idea of access in one of her interviews with r/CrackWatch on how most of the people downloading the cracked games are people who cannot

afford it in the first place. Some treat her like a ‘messiah’, as if saving them from Denuvo ‘cancer’ as she puts it. We can see here that EMPRESS wields the mantel of resistance against these companies.

In addition, Denuvo sometimes reduces performance of an officially released game. For example, a game developed by Capcom called *Resident evil: village* had reports of micro-stuttering and frame drops upon launch. A few months after, when the game was cracked by EMPRESS, she mentioned this in her .nfo:

All in-game shutters [*sic*] like the one from when you kill a zombie are fixed because Capcom DRM's entry points are patched out so most of their functions are never executed anymore. This results in much smoother game experience. THIS IS PURE CANCER AND ANYONE WHO ACCEPTS THIS IS NOTHING BUT A PATHETIC GARBAGE HUMAN SLAVE! (EMPRESS NFO release, 2021).

Ironically, the Denuvo-free release ran smoother than the official one (Irorita, 2023).

This then warranted Capcom to later remove the Denuvo DRM, as users started to question how an illegitimate release was the better option. This further proves the us-vs-them mentality that EMPRESS is trying to fan.

This model change links heavily to the aspirational branch of precarious labor. It is no longer about the crack or the game itself; it has evolved beyond that. EMPRESS cracking games has become a sort of a spectacle in the subreddit r/CrackWatch. The highest upvoted post was the announcement that *Red Dead Redemption 2* had Denuvo removed and officially cracked by EMPRESS one year after its official PC release. In fact, the cracking of *Red Dead Redemption 2* made so much of a ruckus that it had leaked to other subreddits such as r/all, where fellow Redditors asked “Hey saw this from r/all and noticed the long chain of awards for a 2018 game out of the loop, has this game been uncrackable since 2018?” (u/UUo_oUU, 2020). It is moments like these that make Empress thrive. She constantly mentions on her subreddit and Telegram group

that she is very much opposed to Denuvo's practices, and she aims to eradicate Denuvo from Denuvo-protected games and that is her main aspiration. She even mentioned in an interview with r/crackwatch that the money she gets from donations is barely anything to cover the cost of living, but the primary drive for her cracking actions is hatred towards Denuvo. We can see here, as a part of precarious labor, an individual seeks out to sink hours and hours of time to eradicate a protection that she believes is "cancerous".

This is the pillar of precarious labor, the freedom to do what you want when you want, and the drive is not always financial. As Tronti (1966) puts it, such labor is a “factory without walls” or rather “immaterial labor” that one can do at their own leisure and release whenever they want, especially since they are the only ones doing it, “Notions include creative labor, network labor, cognitive labor, affective labor and immaterial labor. Whilst such terms are not reducible to each other” (Neilson and Rossiter, 2005, p. 2). This is the freedom of labor, to do what one wants, whenever they want, more on this in Chapter 3.

To analyze, other than the previously theorized competitive nature of the scene, a more ‘political’ or resistant stance is being taken. EMPRESS wearing this coat of resistance against any Denuvo protected game and cracking them to not only show these companies that their methods are not impenetrable, but also to send a message about the quality of their game DRMs and how they will not support a game who uses them. Be wary, I do not say that this is what the scene has completely changed to, for this is merely a case. However, since EMPRESS holds a monopoly on Denuvo cracks as of right now, she can set the flow of discourse. Though this, we see a new immersion of reasons the scene cracks video games, since the competitive aspect as withered away

and a monopoly stands, the ideology of resistance and monetary gain play the center roll now.

B. The Competitive Flames Flicker

However, this does not mean the competition is completely gone, rather, it has now been altered and hindered by labor. I begin with what Gill and Pratt (2008) mention about the competitive creative nature within precarious labor: “[...] are part of what is commonly referred to as the service and knowledge economy. Writers who stress the role of creativity (as a source of competitive advantage) point to the injection of ‘creative’ work into all areas of economic life.” (Gill and Pratt, 2008, p.2). This is very much prevalent within the scene. In fact, this is what helps it stand. Voksi, a retired video game cracker who was active in the scene in 2017-2018, once replied to a user who mentioned “all the hackers should join forces and crack games together” by simply replying “competition is motivation,” clearly indicating from the mouth of a video game hacker themselves, that competition still holds the scene up high. We clearly see here that the discourse of labor has injected itself into the scene, now, rather than who could come out with the most reliable crack the fastest, it is who could be the more creative with their crack.

To give an example, competitive labor is prevalent in a dispute between EMPRESS and FitGirl, a repacking service/website. Repacking within the scene encompasses downloading a cracked file produced from hackers and removing any unwanted files such as other languages and hidden levels to make the download file smaller and easily accessible. Think about them as car salesmen who sell the cars that others manufacture and do the nasty paperwork for you so you don’t need to worry too

much; just download and install the game like you normally would. When *Immortals: Fenyx Rising* was officially cracked by EMPRESS, she intentionally throttled her upload of the cracked package to 200Kb/s, essentially rendering the download for other users useless. This is due to the nature of BitTorrent, as it heavily relies on others uploading packages (seeders) to peers to share the download capacity instead of one provider having to tank all the traffic of downloads.

Now, when a new crack is available, usually the group who produced the crack would upload the file, naturally, without any peers helping the upload as no one has access to the file yet. Hence, EMPRESS was holding *Immortals: Fenyx Rising* hostage and not allowing anyone to download the crack for the simple reason of recognition. EMPRESS stated through her online forums that she was sick and tired of re-packers getting all the praise for repacking the games she worked hard on, as most of the consumers do not understand how the scene works and can think the re-packers create the crack themselves. As mentioned before, the re-packers are considered the face of the scene to newcomers as they are easily accessible. FitGirl responded to this heavily by swearing never to repack any EMPRESS release again as she saw it as a petty and pathetic attempt to get more popular and goes against “common logic and piracy ethics.” (FitGirl, 2021).

Competition is still very prevalent within the scene where we find groups lacing their cracking code with DRMs of their own. EMPRESS later apologized to the audience and the re-packers, in a statement on her subreddit, and in good heart FitGirl accepted the apology but stood her ground on no longer providing EMPRESS related re-packs. EMPRESS cloaks her crack code with a DRM of her own, either Themida or VMProtect, to keep her work secret from other competitors of in the scene who might

steal her tricks and produce their own cracks. The Irony here we see, EMPRESS's role is to remove DRMs from games, a system built to prevent unwanted copying and sharing of content, only to place DRM's of herself to also prevent unwanted copying and distribution of her own hacks/cracks as she wants to remain on-top in the competitive scene. Proving still that one of the main reasons these groups are in this scene is for recognition. FitGirl continues to say that Conspir4cy do not shield their cracks from the world as it is an open market. We see here a shift in scene, a shift that has EMPRESS at the epicenter of it.

Unsurprisingly, majority of the community took the side of Fitgirl. With members saying EMPRESS's actions is that of a child seeking attention and that she wants all the credit for herself. Not just because figure was affected but majority of the community who was looking forward to that cracked game from EMPRESS also could not download it. It doesn't help the Empress has a "villainous" reputation within the scene and is known for her outrageous remarks generally said through her nfo's, so whenever there is a slip up EMPRESS is quick to blame.

To illustrate the competitive scene from another perspective, we look at the politics of the scene. Looking at this lock of horns, this time between Steampunks and Skidrow. Both groups being prominent figures in the scene but, while Steampunks have died down, Skidrow has consistently produced cracks for over 15 years, just nothing Denuvo related. Skidrow has written a very long and interesting .nfo in their release of *Devil In The Capital* celebrating their 10 year anniversary, in it, they heavily criticize Steampunks' methods of cracking Denuvo DRM, the NFO reads:

And while you're thinking, we know keygens have existed for way longer that those punks that decided to release with a keygen instead of a crack. Just saying that there are people out there that have spent hours and hours on doing magic, contributed and still does, when others go public and

possible ruin all those hours. You can bet that those keygens are just a short fame period, because Denuvo developers will for sure close that possibility in a future edition. (SKIDROW NFO release, 2017)

Skidrow criticizes SteamPunks for using "cheats" to crack Denuvo in an open-world competition. They mention that these keygens are not legitimate forms of cracking Denuvo games as if trying to level a previously agreed upon ruling for cracking Denuvo, when in reality there was no rules on how to crack Denuvo.

As mentioned before, Steampunks utilize a unique tool of by bypassing Denuvo protection through an age-old method: keygens. There are two things I would like to point out here, one, is how certain politics such as progressive and conservative ideologies exist within this confrontation. Skidrow was arguing on a more conservative front: we must stick to the normal ways of cracking Denuvo as it is the only way to be completely safe from their security, while Steampunks take a more progressive end: utilising old methods in new and interesting ways to get the same results others are getting, but at a much faster pace. With this political stance, we can distinctly see a "Liberal" vs "Democrat" line of thinking, as in, two different ways of thinking in that one wants to stay behind and crack games the traditional ways and blaming the other for taking their thunder. It is on the back of these ideologies that competition stays prevalent.

For the second point, the competition exists, and impacted Skidrow enough to comment about it. This was solidified even more with Steampunks response to Skidrow through the greetz of an NFO of their own one week down the line: "I bet you all wonder what we are going to answer to those "funny" comments towards us, well frankly, we had a great time and couldn't stop laughing. Thank you for that great moment full of hot air." (Steampunks, 2017) It is almost humorous as to how Steampunks plays the

progressive villain in this short story, and this heavily links back to **why** these groups spend so much time in the scene.

What can we unpack from all this? I'd like to bring the attention to Florida (2002) and Reich (2000) in which they describe that the "new" media workers and hailed as "model entrepreneurs" by industry and government figures, and more than that, are considered to be the representatives of the "brave new world of work" (Beck, 2000; Flores and Gray, 2000). When linking this to the warez scene, or these hacking groups in general, there is an unorthodox link between their work and a "brave new world of work." In the scene, the brave labor is placing one's own security and legal standing at risk for the gain of social capital, pleasure, esteem, ego, standard and the trill of the puzzle... is this not "brave"? Or are we to leave that label to the mothers out there who raise and work around the house for no finical incentive? (Jarrett, 2014).

Furthermore, we talk about risk and responsibilities arising from this precarious labor that the individual (hacker) knows will arise (Allen and Henry, 1997; Jarvis and Pratt, 2006; Batt, Christopherson, & Rightor, 1999; Gill, 2007; McRobbie, 1999, 2002; Neff, Wissinger, and Zukin, 2005). Looking back, Voksi was arrested after getting too comfortable with the community and sharing methods to crack Denuvo in 2018 "It finally happened, I can't say it wasn't expected, Denuvo filed a case against me to the Bulgarian authorities." (Voksi statement in r/CrackWatch). In his final messages he mentioned why he was cracking Denuvo games, surely enough, "Sadly, I won't be able to do what I did anymore. I did what I did for you guys and of course because bloated software in our games shouldn't be allowed at all." It was an act of bravery/resistance on something he had believed in, something that EMPRESS also shared a belief in, the right to free access software. As if in a poetic move, Voksi sighed of with this "Maybe

someone else can continue my fight.” and sure enough, EMPRESS is leading the anti-Denuvo charge right now.

In conclusion, aspiration and precarious labor are what hold the scene together. In a scene with no financial motivation and no career advancement, it rests upon the role of ego and competitiveness to drive the motivation to crack video games. We see that Empress throttled uploading her crack because a re-packer known as FitGirl was stealing all her thunder, when in fact Empress put the hard work in, and FitGirl just compressed the size of the game. Steam Punks and Skidrow had an online quarrel with Skidrow accusing them of "cheating" by using keygens to crack Denuvo. Due to its simplicity, keygens helped release Denuvo games faster and reliably.

To unpack these, we clearly see that the crucks of the scene lay heavily on recognition. The fact that Empress was unwilling to upload her own, newly cracked game in a form of retaliation against repackers, in this case Fitgirl, give a very clear indication as to why this decision was taken. To prove it further, Empress released a statement announcing why she kept the upload throttled, and she stated very much so that it's because Fitgirl keeps taking the recognition of her cracks. This is not at the fault of Fitgirl who never mentioned these are her own cracks, in fact, she credits the cracker in the title of the game, but due to complex nature within the scene, casual goers do not know these names and just assume she is cracking them herself. Eventually this resulted in Fitgirl no longer repacking any Empress cracked game. These are but a few stories in the endless pool of disputes and competition within the warez scene.

CHAPTER III

THE ART OF VIDEO GAME CRACKING

If there's one thing I learned about human nature: someone who thinks they're untouchable, will attract hostile attention of a lot of people that might not have happened otherwise, and generally there are at least a couple among them who can bring the arrogant one down. (r/CrackWatch, an anonymous cracker)

Researching software and video game cracking is no easy feat. After all, this is an illegal activity—and one that is also socially condemned. As a result, studying the Warez Scene requires an appeal to untraditional sources. In this section, I draw on r/CrackWatch and an interview with the famous former Denuvo cracker, Voksi, to explore how cracking video games can be considered creative labor, and how different type of protections need different methods of cracking.¹

A. Labor

Bringing your attention to the scholarly articles around video game cracking, they tend to brush over the art of cracking a video game. Through this research; you will find the competitive nature and the cat-and-mouse game developers and hackers play with each other, that plays a prominent role as to why video game crackers love to take a lot of time out of their days to hack games. I interviewed two people; one of them is a game developer who works on designing and coding mobile games on the iOS and

¹ It is necessary to point out that this chapter will include details on how to remove, circumvent, trick Denuvo or any DRM that exists in games. The point of this chapter is to show how one of the motivations of the precarious labor is that video game cracking requires creativity, problem and puzzle solving, and a lot of dedicated time with effort – this is only possible by picking the mind of a game cracker and running through the steps they take to remove a DRM. However, this chapter will **NOT** teach you how to crack current DRM protected games.

Android store, while the second individual was the aforementioned Voksi. I will be referencing these interviews throughout this section.

This section of the chapter will look at labor itself as I believe it is important to define what labor is and how it pertains to my topic of research. Naturally, the term labor can be defined as effort that creates values. Such values can be also known as goals that one may aspire to reach. As this pertains to my thesis, the labor, or rather, the effort being used is the cracking and hacking these release groups undergo to create the value which is a game that is completely free of DRMs or any other systems put in place to prevent illegal copying and distribution of the product.

Due to the illegal nature of this labor, researchers tend to marginalize this online group as people with no lives and "modern pirates". While to some extent this is true, it is completely ignoring the labor required to achieve such value. In fact, as we will find out more throughout the chapter, such a labor has a high skill ceiling and not anyone can pick it up. As mentioned before, it takes crackers sometimes up to 40 hours to crack a game. More recently, we know that Empress sometimes takes months to crack a Denuvo protected game. While we looked at the reason as to why one would spend so long cracking a game, you want to look at how the labor of cracking a video game also contributes to the reasoning as to why video game crackers do what they do.

One of the reasons people undertake precarious labor is because of the creative output they're able to achieve. Taking a look at old school YouTubers like Smosh, I mentioned in an interview that they started creating online YouTube skits as an avenue for creativity and fun, and they never knew that it would branch out into a financially successful career. Plenty of creative avenues that start as precarious labor could branch out into a successful and financially rewarding career, however, within the warez scene,

no such career path is possible. It is incredibly difficult for crackers to make careers out of video game cracking due to its illegal nature, however, on the rare occasion, DRM companies such as Denuvo could reach out and offer a job. So is the creative input really that worth it? In the next section, I delve deeper on how release groups crack video games. I will touch upon three different methodologies and discuss one of them in detail.

B. Creativity

Throughout my research, I have found different cracking examples and methodologies, ranging from circumventing simple password protected games to cracking Denuvo itself. I have categorized them into three different categories based on their level of difficulty/problem-solving skill requirements: (1) emulation; (2) jumps; and (3) obfuscation and virtualization. Although there are a lot of different ways to crack a licensed video game, with the possibilities expanding even more if we introduce console games, I have chosen to discuss these three points as they will help illustrate the idea in this chapter, with each point increasing in cracking-difficulty.

To the programmers, cracking a game is a game within itself. Like a puzzle piece, crackers try to determine loopholes, vulnerabilities, and code entries in order to remove DRMs from games and release them to the public. So, we ponder the question: what is cracking, and how does it work? It is important to start thinking differently here; to crack a game, you need to think like a user, an architect, and a mechanic. A user would think about how one would logically experience this game; no bugs, no jittering, and good quality performance, this needs to be preserved. As an architect, you will need to understand the code structure, and how to dismantle it where certain levels are coded,

and how to alter them. As a mechanic, you have the hardest job. Hacking and cracking revolve around reverse-engineering the code of the game: starting from the end of the chain, which is the final product given by the developers, and figuring out how X points or codes have reached that Y location. It is like taking apart a car and reassembling it based on memory. “Reverse engineering can be defined as the process of analyzing a subject system to 1) identify the system’s components and their interrelationships, and 2) create representations of the system at a higher level of abstraction” (Chikofsky and Cross, 1990 pg12). Cracking is not as simple as finding ‘Print = “Wrong Key”’ and redirecting the code’s pipeline. Usually, game files are encrypted with specially made encryptions to make it as hard as possible for a consumer to read.

C. Emulations and Jumps

Emulation is considered the easiest, fastest, and most reliable form of circumventing video game DRMs. Lacing a video game with new and sophisticated DRM such as Denuvo could cost up to 140,000 Pounds, which most indie game companies cannot afford. So, they rely on Steam, Origin or Epic games (online stores where you can purchase videos games to play on your computer) to protect their released games by integrating basic DRM systems.

Steam DRM, or Steam wrapper as Steam calls it, is a simple anti-tamper technology that has some obfuscation, meaning technology that hides the game code, Steam themselves recommends that developers either incorporate their own DRMs or have online features within the game that prevent cracking (Steam Website), This DRM works very simply, once a game is launched it requests steam for a unique serial code to

verify that said game is legitimate and can run on said PC. No further checks are done throughout the game, only once upon launch.

For this level of cracking, not much creativity is needed, you could almost automate this workflow and run a release group on your own. However, this does an important thing within the scene, other than providing consistent and reliable cracked (emulated) content to the masses, the overabundance of games being released every day allow releases like EMPRESS to shine even more. Ironically, her work becomes the AAA titles of the scene, similar to how regular AAA games are sporadically released, and are hyped up for, EMPRESS's release for their cracked version is marketed and talked about before its release. This is normally done on her reddit page r/EMPRESSEvolution, and later her telegram channel that she launched after reddit shutdown her subreddit. The starve of good quality cracks to highly anticipated games is answered by people like EMPRESS.

Jumps is a more complex form of video game cracking, that involves "jumping" over lines of code that includes restrictions to the application.

The anonymous developer I interviewed directed me to a website you use to participate; said website hosts dummy programs released by other programmers for ethical hackers to train by trying to crack into them, all for educational reasons. This challenges hackers to think outside the box as programs are ranked 1 to 5 in difficulty, posing an increased challenge for them. The website is called Crackmes.one; my interviewee laid out the simplest way to crack a game that was used on older games. It involved changing lines of code and using it against the program.

This is where the creativity in reverse engineering code comes to play. Every developer has different ways to protect their code and hide certain vulnerable lines of

codes through certain doors. It lays on the shoulders of the crackers to figure out the architect and remove/skip its DRM. Just imagine a Denuvo-protected game that normally takes months for scene groups to crack and officially release. To add more, my anonymous interviewee told me a story of how their company takes into consideration potential hackers that may crack their games and release them for free. He told me they rely on Steam DRMs to package and secure their .dll files (files that contain the code of the game). The story continues with them hiring a small-time hacker to try to break the code of their game to find any loopholes or vulnerabilities. They knew eventually the game would be cracked, but they didn't want to make it easy for the hackers. As expected, after the release of the game, they found it on various torrent sides already cracked and shared.

D. Obfuscation and Virtualization

In this section, I aim to present the argument that Denuvo requires the most amount of creative labor needed to crack. To illustrate this argument, I will need to dive into how to crack a Denuvo protected game. I will use an outdated method that Voksi detailed to me to illustrate this point. It is important that I describe how this crack works for you to fully appreciate the creative ingenuity required to crack the biggest games.

Before showing you the creativity, time and problem-solving skills required to break through the worlds hardest anti-tamper technology, we first need to rundown how Denuvo Generally protects videogames from infiltrators.²

² To preface this, I need to mention that I will not be going into detail on how Denuvo protects its games as this is not public information. Futuremore, these methods are surface level and with every Denuvo release, the add new and sophisticated anti-crack defences so it is more than likely these protection methods are either severely advanced or outdated. Denuvo does this internationally to avoid any exploitation. However, by gathering information from Voksi, Denuvo's website, and discussions on subreddit r/crackwatch, I can come to a few conclusions.

Denuvo is different to all other regular DRM. For starters, it is not considered a DRM. Denuvo is considered an Anti-tamper, a system put in place to prevent an intruder from changing/altering/viewing the files of any game it is installed into, call it a DRM for the DRMs. It uses obfuscation and virtualization to shroud the games code. To obscure the games code and any other DRM, Denuvo utilizes bloatware, a hole heap of useless software inside the game's code, to bloat the game's size and mix relevant, useful game files with useless irrelevant code to make finding the correct lines of code more difficult. Denuvo also uses a virtual machine to run the game on another "minicomputer" inside one's own computer. A virtual machine (VM) is a completely self-contained operating system running on one's own computer. Think of it as a computer in a computer, Denuvo runs the game you are playing in a smaller, minicomputer inside your machine that only it can access. In this VM, Denuvo completely seals off the game you are playing from your computer, not allowing any influence from external software.

To continue, Denuvo always requires you to be online as they lodge your hardware (computer) information, more specifically your processor ID, on their servers and constantly run a check to see if your hardware ID matches the information they have of your computer. Due to all these constant tools running all at once, it may put some strain on your computer thus resulting in lag and stuttering of the likes that gamers have been complaining about.

Denuvo-protected games that are the toughest challenge in the scene, the ex-cracker by the name of Voksi, who I had the privilege to interview, uploaded a 1 hour and a half video of him successfully cracking the Denuvo-protected game *Prey*,

teaching audiences how to crack a Denuvo-protected game, and as expected, it was as complicated as it sounds. Voksi split the cracking process into five steps:

1. “Finding OEP, redirecting Denuvo allocated page to physical one in the exe.
2. Redirecting image data directory checks to fake image data directory
Denuvo gets base address for kernel132.dll, ntdll and kernelbase from the process head to find the initial check, we must access breakpoint that.
3. Patch VM hardware checks
4. Redirect additional kuser_shared_data checks to fake section
5. Patch additional cupid checks to finish the crack” (Voksi, 2018)

Naturally, to the untrained eye, we cannot understand anything he is saying, but through the process of the video, he is able to crack the game. However, the crack is very unstable and jittery. He mentions that the reason for this is because the final step is the most time-consuming and tedious step of them all. Modern triple A video games run something called CUPID checks very frequently throughout the user’s playtime in the game. These triggers/checks can be in the shape of characters entering rooms, interacting with objects, triggering dialogues; think of them as random traps placed throughout the entire game that, once triggered, check whether the game running is a legitimate, licensed product. If it reads that the product is not legitimate, it will either slow the game down, ultimately introducing glitches and bugs, or crash the game. It is on the cracker to fish out all these triggers and remove them from the game. In Voksi’s case, *Prey* had over two thousand triggers that he needed to manually find and patch within the assembly code. Naturally, such a process is very time-consuming and gives reason as to why Denuvo cracks take months. Even after Denuvo cracks are released,

sometimes the same group release crack fixes as the audience find other CUPID triggers or bugs that lie within the game.

I would like to give another example that Voksi shared with me, a method Voksi had to conjure up one day when attempting to crack a new Denuvo version on a game he was having trouble with one day. Voksi required some more creativity in how he wanted to approach Denuvo cracks, he came up with a method of using exception handlers within his crack.

To put it simply “exception handlers” in any software is a fail-safe mechanism put in place to save a program if anything unexpected happens. Have you had a moment where you are on a program, and it suddenly lags and stops working only for it to work again after a few seconds? That could be an “exception handlers” doing its trick.

Exception handling is the process of responding to unwanted or unexpected events when a computer program runs. Exception handling deals with these events to avoid the program or system crashing, and without this process, exceptions would disrupt the normal operation of a program. (Gillis, 2022)

So, what Voksi did was set up his own exception handlers inside the code of the game. Within these exception handlers he placed code that would “touch” the walls of the virtual machine that I mentioned earlier, triggering a Denuvo legitimacy check, and when said legitimacy checks would happen this exception handler would intervene and give false information to Denuvo, tricking it into thinking this was the correct license.

Voksi goes on to mention that such a method was not all that impressive compared to other methods used by the likes of CPY, who used more sophisticated methods. Nevertheless, we see the creative and problem solving needed to overcome

Denuvo, tricking Denuvo by triggering a license check by yourself and feeding it false information is truly no feat to ignore.

In this description, Voksi managed to use a preexisting Windows software that is primarily used for saving and troubleshooting crashed programs against itself. Weaponizing it against Denuvo and using it to trick itself to generate its own keys that ultimately feed itself. It becomes a perpetual loop of generating and feeding itself by using these exception handlers as a creative solution to the problems he was facing. As far as he knows, no one else cracked a Denuvo protected game like that before, which further solidifies its originality.

E. Counterattack

The creativity within this labor is very prominent and is also worth noting that it is not one-sided, rather, on the other end of the spectrum, game developers also have fun countering these pirates and crackers. For example, the developers of *Mother Earth* had an interesting way of dealing with pirates. If the game detected that the copy was illegitimate, it would spawn more monsters making the game significantly more difficult for the player to progress. Moreover, in a troll-like fashion, once you reach the final boss of the game and deplete almost all its health, the DRM-protected game would instantly crash, forcing the player to reboot it and be presented with a wiped game file – over thirty hours of gameplay gone. Another example where the developers took a more comedic approach, was in *Serious Sam 3*, whereas if the game detected an illegitimate copy, the game would spawn a humanoid scorpion wielding two machine guns that is invincible, very powerful, and very fast; rendering the player unable to progress through the game as they would keep getting killed by an immortal man-scorpion. Finally, other

companies chose to take a more subtle approach in the case of *Alan Wake* where, instead of creating progress-stopping systems, they simply had the main character wear an eyepatch with the skull and crossbones logo on it; constantly reminding the player of their “dirty” pirate practices, as if to make them feel guilty.



Figure 1. Alan Wake pirate eye-patch.



Figure 2. Serious Sam 3 humanoid scorpion.

What's interesting to note here is that video game developers know that they're games will ultimately be cracked. It is almost impossible to completely protect the video game from any external penetration. So, some companies decide to lace their games with a different kind of security, one that involves not allowing the player to progress through the game or subtle reminders to the players that they are playing an illegal copy of the game. DRM's are software's made to make cracking games harder, but adding these extra gimmicks within the game themselves adds an extra layer of security and plays the game against the crackers themselves.

What can we conclude from this? As Jones (1996) puts it, “they are also conjured in more critical discourses as exemplars of the move away from stable notions of 'career' to more informal, insecure, and discontinuous employment” (Jones, 1996); the term “discontinuous employment”, I believe, fits perfectly in this narrative. We see a clear trend of the mind against the machine, using one's own logic to crack and remove DRMs from the cusps of the software while enjoying the challenge as they can move at their own pace, and adopt an informal schedule to cracking these games. In fact, official labor, and long hours with daunting deadlines at real life jobs can be view as exploitative, but it is always the passionate engagement, creativity and self-expression that grounds these people (Gill and Pratt, 2008). It is the changing nature of the work that keeps it interesting, the constant flexing of creative muscles and challenging others to produce similar quality cracks that sets the standard in the scene. Although very technical, what was illustrated above was but the tip of the iceberg on what cracking and hacking is, warez groups sometimes write entire scripts that they

keep secret and only use within their groups in a twisted irony of intellectual property and the fear of duplication.

To summarize, given that labor is effort that equates to value, sometimes value is hard to obtain, thus either excess effort or creative effort comes into play. Excess effort requires one to overwork and find a solution to a problem that they cannot solve or they can have a more creative approach and solve a problem with already existing tools, in this case, exception handlers. We detailed in this chapter how one would remove DRMs and how new versions of Denuvo consistently patch newer ways of cracking them; so it becomes a game of cat and mouse between the cracker and the developer, with the developer creating more obstacles and the cracker learning to overcome them. I also touched upon other ways of cracking games that didn't require that much creativity, but nonetheless needed some form of thought. It is this ever changing inconsistent and swaying warez scene keeps it interesting for the crackers.

CHAPTER IV

THE AESTHETICS OF THE WAREZ SCENE

In this chapter, I look deeply into the aesthetics of the scene – how art is expressed through projects and used terminologies. How is art in such an underground scene expressed? And most importantly, how does this pertain to the motivation and precarious labor of these release groups? This chapter builds on the past 2 chapters, where we have established that within the scene, motivation, competition and creativity is what drives the scene forward. This chapter looks at where this motivation, competition and creativity is situated and how it is expressed. We will be looking at subsections within the Warez scene, such as the Demo scene, ASCII and ANSI art, and chip tunes (8-bit music that was very popular within the scene) and showing how these were used as creative mediums to express their cracking talent.

Furthermore, we will be looking at how crackers express themselves through these art mediums, and as to why the scene has chosen images like dragons, skulls and barbarians to represent their underground persona. It is also important to note that majority of these findings and artistic language has been watered down through time. The current scene is but a shadow of its former self. While majority of these concepts remain within the scene, they are not as impactful as they used to be.

Within every culture, subculture, and counterculture exists the idea of representation through art. Famous periods of artistic linguistics shined through history such as the Italian Renaissance that saw a shift in artistic expression and design, that ultimately sent ripples which shaped future artistic expressions centuries down the line. Herbert Marcuse's model of art and its perception introduces this chapter perfectly:

Inasmuch as art preserves, with the promise of happiness, the memory of the goal that failed, it can enter, as a 'regulative idea,' the desperate struggle for changing the world. Against all fetishism of the productive forces, against the continued enslavement of individuals by the objective conditions (which remain those of domination), art represents the ultimate goal of all revolutions: the freedom and happiness of the individual. (Marcuse, 1977)

A. Romanticization

It is no secret that the Scene holds a great many words and terminologies that would completely fly over any unsuspecting listener, but there is one word the mass can all agree to know – and that is “Pirate.” When searching general media such as Hollywood made films about pirates and the like, we are presented with films such as *The Pirates of the Caribbean*, *Treasure Planet*, and even *Sinbad: Legend of the Seven Seas*. Such film has a pirate play the center protagonist role plundering treasure and avoiding the marines/sea police. Shinning a light on the epic adventures that come with being a pirate but completely overshadowing the countless deaths, rapes, ransacking and kidnappings that real, unfiltered pirates commit every day. From this perspective pirates are no-good problem makers that cause trouble wherever they find themselves – but the ideal pirate is seen as the one that resists capitalism.

The term “Pirate” or by extension “Piracy” is romanticized, that is, the idea of resistance against capitalism (Eve, 2021) and this is where the artistic venture begins. Being a pirate carries within itself a revolting mentality. Normally, theses release groups within the scene are hailed as heroes and praised for being pirates by releasing games that would otherwise be inaccessible without them. We see the importance of art in the works that these hackers do when releasing cracked games, as mentioned in chapter 2, removing DRM’s requires creativity and puzzle solving skills, if successful, the final product can be considered an art piece in the Scene culture. This is the core

basics of distribution: distributing media isn't copying and reproducing certain content, for every passing of the torch, the content has changed. Similar to when one sends images online, with every forward, the quality of the image gets slightly lower as the file compresses, therefore altering its original form.

Therefore, the warez a member distributes is no longer the original product, but a unique product that they created, their art piece. A copy of a game that is "liberated" from the clutches of capitalism. Release groups deal in "remix culture" in which they copy the original release but at a twist to it, sort of like a song remix, and release it to the public (Eve, 2021). After all "immature poets imitate; mature poets steal; bad poets deface what they take, and good poets make it into something better, or at least something different." (Eliot, 1921). Although this doesn't apply to all art, there is a striking resemblance to Eliot's quote and the scenes remix culture. The Scene offers something the original does not, a DRM free experience of a game, thus the "poets" or in this case, "artists" that imitate to make something "better" (in the scope of the scene audience).

B. The Demo Scene

The first major stop when exploring the Warez Scenes art sprouts from the Demo scene. The Demo scene is an online (and offline) community that came to light in Europe beginning the late 1980s as computers became more affordable, and software was easily cracked/bypassed. Computer nerds started huddling around to create 3d animations and renditions appropriately dubbed "Demos" in which they would demonstrate their coding, modeling, artistry and composing abilities through sequences of 3d art (See figure 7). Back in the 1980s files could only be transferred on 64

kilobytes - or 65,536 Bytes - of CD ROMs, limiting file executables (executables is like a program) to this file limit. The challenge was to create more elaborate demos while limiting staying within the 64Kb limit. Throughout the years as computers advanced, and transfer limits increased.

Size-coding demoparties stuck around and maintained this 64kb size limit as a challenge to anyone who can code the most elaborate demos withing the 64kb limit. New categories also began to emerge like the 1024kb demos. Demoparties are events held at venues where groups would go and show off their demos in competitions, whoever could show the most impressive sequence in the corresponding size-limit categories, would win. For example, the demogroup “*Farbrausch*” won the 2000 demoparty event simply known as “*The Party*” by releasing an extremely impressive



Figure 3. fr-08: .the .product By chaos from Farbrausch.



Figure 4. Elevated by TBC and Rgba.

64kb demo dubbed “*fr-08: .the .product*” that featured multiple scenes of 3d spaces with an eccentric 8-bit sound track that went on for around 5 minutes (see figure 6). Most notably, members from the demo scene later moved on to become figureheads in video games development. Games like *Control* and *Hitman* had demo scene veterans working on them.

The demo scene and the Warez Scene meet at the junction of coding and cracking. Why is important that I relay the information of the demo scene and how does it link to the Warez Scene? While both scenes used coding and programming to achieve



Figure 5. Cracktro Examples.

a goal (the demo scene also dabbled in software cracking) both come hand in hand to deliver the final product to the consumer. When a release group from the Warez Scene successfully infiltrated a DRM and cracked a video game, in the rat race of recognition in this online community, any form of elitism and showing off was not shied away from. They used to lace these DRM-less games with “Cracktros” (a merge of “crack” and “intro”) that would play upon the launch of the game (see figure 8) in where they would proudly state—in a similarly animated demo fashion—the name of the release group that cracked the game accompanied by greets and recognitions across the scene.

These intros were staple within these release groups and majority of the scene would adopt this form boasting. After all, the scene stands on this gamified rush of who can crack what the fastest and who can infiltrate the toughest DRMs, so after a group had achieved such a feat, they would proudly plant their flag onto the project. As mentioned before, when in distribution, a piece of content changes from one hand to another and loses its originality, it becomes something else and within the scene the market this change of originality as if it was their own product, a bow on a present if you will.

Even more so, the demo sceners compete with cracktros as well, who can provide the flashiest and best cracktros to be coupled with the best and toughest Warez Scene cracks (Eve, 2021)? This would in turn promote these demo scene groups as the Warez Scene was far more popular. As a matter of fact, these “demos” were in so much fierce competition that they would often use these intro screens to insult each other (See figure 9). One intro screen back in 1984s went so far as to leak the numbers of other crackers (Figure 10)



Figure 6. Aline Munchies's message to Freeze.



Figure 7. Tri-State Pirates leak phone numbers of other crackers.

The artistry doesn't stop there, Release groups build brands/identity through graphics, music, and ASCII (more on this later) through keygens. Key generators or more commonly known as keygens, are basically small software that uses mathematical algorithms to generate license keys for software downloaded from the internet.

Normally keygens could look bland or be as simple as a button that says “generate key” that spits out a key when pressed. Some scene groups find this as an opportunity to implement their brand into it. For example, as mentioned before, steampunks use keygens to bypass Denuvo related cracks, and these keygens feature the logo of Steampunks with same colour scheme across all keygens (see figure 11) and the mandatory chiptune, techno 8 or 16-bit music. What is interesting about this is that each keygen is different, with different songs that are **composed for that specific keygen only**.



Figure 8 Steampunks Keygens following the same branding guild lines.

“It lets you showoff, you know, - and when you say about motivations, why are people doing the artwork (demo scene)? - It is for fame and to kind of... Beat the other guys, you know you are a better group.” This is Carsten Cumbrowski, one of the co-founders and resigned leader of Superior Arts Creation (SAC), an arts group founded in December 1994 that prioritized and was one of the figureheads that led the art boom in the early BBS (Bulletin Board Systems days. While Cumbrowski was more active in ANSI and ASCII art, he had members within his group who used to create demos for demo parties and for Warez scene members. He would describe demo parties in detail, how there were categories for music, ANSI and ASCII art, programming, and of course the main event which were the demo showcases.

“With the demos scene, things need come together [to make] a good demo, great. Just good-looking demos doesn't win the competition, if it just [has] great programming effects [it] doesn't win the demo (party), only good music can push it a little bit further, but to make a great demo, all three has to come together.” - Cumbrowski

So, through all this, what can be unpacked? The demo scene was a staple space in creating simulations and animations that sprouted from the Warez Scene and ultimately took a on life of its own. However, when looking at the source of it all we can find the source of this motivation, which also links to the Warez Scene, and that is limits. Limits or limitations is what carried these young men to create the most profound and exaggerated demos ever seen at the time, this is evident by 2 points:

1. The current state of the demo scene
2. Impact of the demo scene had the current gaming scene.

The demo scene is but a shadow of its former self. What I see when accessing the Demozoo.org, the Wikipedia of the demo scene, I find that there is a substantial amount of active demo parties even in 2023. In fact, it seems that the amount of demo

parties has stayed the same or increased since 1990. But upon further inspection, the quality of the demo parties has significantly decreased. First, the majority of the current day demo parties are done online or by peer-to-peer organizers that do it for leisure as opposed to real, big party events that Cumbrowski described to me as a huge hall full of computers, organized by professional personnel with different categories to compete in. Secondly, the quality of the winners from the 2023 demo parties pales in comparison to the winners of the demoparties of old.

Take for example Lovebyte, one of the most prominent and professional demo party organizers in the modern age who conducted a demo scene party in February 2023, when comparing the winners of the 64kb “old school” and “high end” categories to the 2000s winners *farbrausch*, creators of “*fr-08 :.the .product*” who won in the same category, the difference is very prominent.



Figure 10. “Aurum Argentum” Winner of 2023 Lovebyte.

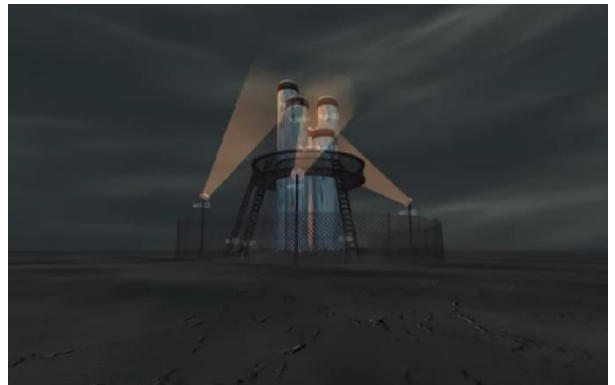


Figure 9. “fr-08: .the .product” Winner of 2000 The Party.

Aurum Argentum was dots on a screen moving in synchronized way; it was not accompanied with any music. While *fr-08: .the .product* was an 11 minute video with a full score and 3d renderings. One of the reasons for this huge disparity is *Aurum Argentum* was worked on by one person (Argentum, 2023), while *fr-08: .the .product*

that had a full team consisting of programmers, designers and composers (as shown in the credits of this demo).

Our current compressing technologies allow us to create bigger and better demo showcases while staying in the 64kb limit, however the scene lacks the motivation and atmosphere that existed back in the early days. The fact that floppy disks was a hard limit for transferring data motivated and gave birth to the scene, however now, where Gigabytes of data can be transferred online within a second, the limits are self-imposed, and the scene has moved on.

To continue, ever since the limits have been broken through and technology has advanced, demo scene members have taken to create modern day video games based on the technologies and abilities they catered to in their early demo days. For example, Jesper Kyd, a prominent video game music composer who wrote music for games like the Assassins Creed and Borderlands series started off in the demogroup called “Silents DK”. Also, IO interactive, a game developing company, was started off by demo scene members. One of the reasons they were able to launch their careers ahead like this was the motivation to create something remarkable while limited, which forced them to think outside the box, sometimes leading to technological breakthroughs, which would in turn allow them to make a career out of it.

Even when looking at the aesthetics of the scene, purely from a visual standpoint, you will find laced within its fabric the essence of this thesis: motivation through competition. Very similar to the actual Warez Scene, where they would compete on whom would be the first and could produce the best cracks, the demo scene sought to create the best simulations with the limited capacity they had. Motivation through limitations.

C. The Lost Art of nfo's: ANSI and ASCII

While demos and the demo scene focused on creating simulations, videos, and intros to spice up a newly released software/game crack, these cosmetics were optional: similar to a newly released book having an appealing book cover; not entirely necessary, but great for marketing. However, NFOs are mandatory within the scene (Scenerules.org) and even more so, certain information that must be present on the NFO file or else the release will get Nuked. Information such as the studio who created the game's name, title of the game, group release date, and group's name among many others are required. These strict guidelines are detailed within the rules of the scene. So, while every release member must abide by these rules and release an NFO file detailing information about the released software, they are not limited on HOW they show it.

I then arrive at the second point of this chapter, ANSI and ASCII art. These two art forms are what is used to create NFO files, the lines, and hashes plus any characters available come together to present an art piece made completely in a text file (See Figure 14 for an example). If you look closely, you can see the NFO is comprised of dots, lines, and dashes in different shades of grey. This is where this style of art is incorporated into the scene, through NFO releases.

There is a difference between ASCII and ANSI art. Both are primitive forms of computer art that focuses on using characters instead of traditional brush strokes and/or drawings, to create digital art. While the true difference between ASCII and ANSI is complicated and requires the knowledge of programming, for the sake of this thesis you only need to know a couple of things:



Figure 11. REVOLT NFO By: b5! From SAC.

- ANSI has more characters than ASCII, 256 vs 128, thus ANSI can create more variety of artwork.
- While ANSI is visually superior, it had problems of reproducibility. ASCII art can be freely shared and accessible to other computers around the world, without any errors. ANSI on the other hand is less versatile due to the nature of its code relying on the language of the computer opening it. So, if an English-character created ANSI art was shared to a computer that uses the Japanese language, the art would distort and be unreadable (Joan, 2017).
- ASCII is simpler and still works on modern coding systems like Unicode (Joan, 2017).

Again, like the Demo scene, the Art scene had their own prominent groups like iCE, ACID, SAC, DARK among many others with each group consisting of ASCII and ANSI artists, musicians, 3D modelers (some use to work in the demo scene) coders and even administrative staff to organize and run the group. Furthermore, like the warez and demo scene, they are all in heavy competition with each other. However, the similarities end here. ANSI and ASCII artists would compete to rise above the rest and ultimately be “hired” or “contracted” by Warez scene crackers to get access to free programs and games (Moore, 2013). That is one of the ultimate goals of these groups, since Warez groups would utilize the expertise of art groups, they would in turn give them access to there crack warez and games in a time of limited access.

While the art scene is a huge historical online organization to which an entire thesis could be devoted, for the sake of my thesis, I will be looking at NFO art as it relates to video game cracking. Generally, NFO art is done primarily in ASCII for simplicity and

distribution purposes. As mentioned before ASCII works on every computer and even holds up in the modern days. Warez scene members and even peer-to-peer crackers would approach these art groups and request art pieces for their NFO's and such, art had become so important within the scene that, aside from all the competition of "who can crack what and how fast can they do it", there was also an aspect of who could get the most prominent members from the art scene to draw there NFO's.

To prove this, Jed was considered the best ASCII and ANSI artist on the scene, this is endorsed by Cumbrowski—the founder of SAC as I previously mentioned—and Doug Moore, the founder of sixteen colors, an online ASCII and ANSI archive, (endorsed through a presentation he gave about scene art). Jed was asked to create a logo for Fairlight (see figure 16), one of the most popular Video game and software crackers of the scene at the time, and had a large presence in the demo scene. Moreover, Jed was a member of ACiD, one of the two original art groups next to iCE that emerged in the early bulletin board area, who were also in fierce competition with each other. Another example would be Roy (Carsten Cumbrowski) who lead another very popular group SAC, worked on Logos for the likes of Razor 1911, Drink or Die (see figure 15) and Dynasty. In fact, Dynasty is a merge between 3 other scene groups that was ultimately pivoted by Roy he tells me.



Figure 12. Roy's DoD logo.



Figure 13. Jed's Fairlight logo.

Recognition is very important within the NFO art scene as well, similar to how EMPRESS signs her cracks on the introduction settings of the game, like she did with the release of Hogwarts legacy, which famously included Denuvo v17 (the strongest and latest version on Denuvo currently, see figure 17) Art/NFO's done by artists are always signed by them and can be seen in every release that uses this NFO. They are usually located within the NFO itself with the writing "name<art group>" if you look

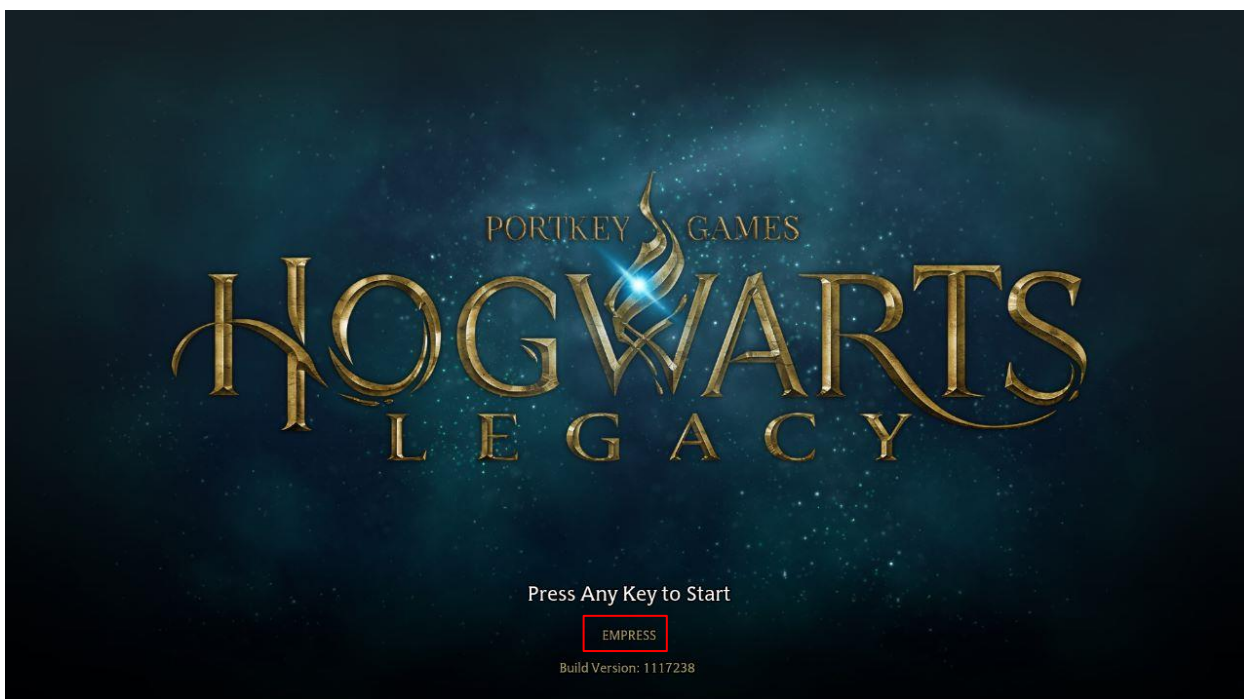


Figure 14 EMPRESS on the intro to Hogwarts Legacy.

back at Figures 10 and 11, you would be able to spot “Jed <ACiD>” and “Roy <SAC>”.

D. Imagery

Now here is where I tackle the core of this chapter, if you noticed in the figures presented, a lot of the imagery shown through NFOs from the Warez Scene has this dystopian, medieval, and barbaric imagery. Weather it is skulls, demons, the high Greek pillars in EMPRESS’s NFOs to the fiery logo of CODEX, the steampunk feel of Steampunks NFO to the punchy DarkSiders image. When asking Cumbrowski this Why do scene groups use these imagery, he told me that majority of the scene is predominantly male dominated.

They were nerds, they used to play dungeons and dragons, read Tolkien books and were big fans of dark and fictional worlds. The scene is primarily made up of young boys seeking to mark their stamp somewhere, similarly to how Walter White in Breaking Bad used his vast knowledge of chemistry to cook methamphetamine, an illegal drug, because, as he stated “I liked it, I was good at it, I was... alive” (Walter White in Breaking Bad Season 5 Episode 16) These young boys were motivated by the thrill of rebellion not just against the law, but also against their peers, who would sometimes doubt them when a new DRM or security measure was put in place for a new software/game. For example, Cumbrowski told me as story of a colleague he knew who managed to crack a very important software used by a huge manufacturing company. The cracker himself had no use for such a software as it revolved around the company’s machine systems and other technological jargon that he and many others would not understand, but the only reason he cracked it was because it was said to have

a new and thorough anti-cracking protection. After he cracked it, he just had the software on his computer doing nothing, the point for him wasn't the software itself, it was the defiance against the odds, the challenge.

As for the black and white imagery shown through NFO files, this was another factor that played into limitations. As mentioned above ANSI and ASCII have limits to how many characters can be used in a single image. The game was to find out who could make the best-looking digital art with the limited tools they have. Even today, where even AI could create stunning art, the nostalgic feeling and memories ANSI and ASCII art holds within the history of the scene remains at the heart of Cumbrowski. The theme of "limitation" is a very common motif in the scenes we have described, with limits come the possibility to overcome the odds, to prove the nay-sayers wrong. In the current modern world where technology has far surpassed the limitations of the past, where certain DRM's are now very tough and time-consuming to crack, the demo scene is now evolved into creating full-fledged 3D games with high resolution textures and particle physics, and digital art has become a beast of its own spawning endless careers and having digital go beyond their 8-7 bit limit. Today small communities remain and compete in competitions like the demo scene, and a few people still release ASCII and ANSI art online, as a homage to what once was.

In conclusion, the aesthetics of the warez scene is where all stations lead to. It is the epicenter of the warez scene. It is the primary reason why the warez scene exists today. While we have mentioned in previous chapters that a cracker enjoys the competition and creativity when cracking video games, it is the limitations, the naysayers, and the artistic vision of the scene that bred such a dystopian-looking online environment. As mentioned before, the majority of the scene consists of younger boys

who are big fans of fantasy and read Tolkien books and often fantasize about themselves being in such a setting, such fantasies are realized within the warez scene where there are almost no rules when it comes to artistic expression. Thus, scene members present themselves by using dragons, skulls, and barbaric imagery to live out this situated fantasy.

Moreover, limitation is what drives the scene forward. When people doubt crackers' ability to crack a game, that is what drives them forward. When there are no adequate tools to crack a game, that is when it is the most competitive, and when an artist wants to express their artistic vision through only dots and dashes, that is where he flourishes the most as it is through the breaking of these limitations that the scene comes to be.

CHAPTER V

CONCLUSION

Alas, we have come to the wrap-up of this research. At the starting of this thesis, I asked why was hackers spending so many hours creaking games? Why was the scene structured in such a way? What motivation do these groups have that pushes them on for years and years with almost no financial gain? Through my research I have seen a newer model that some groups are utilizing: donation request for games. There is now a larger finical incentive for some people in the scene to continue cracking games. Moving on, we can clearly see the link of precarious labor in the aspirations these hackers wish to be, the ideologies they represent, that of anti-Denuvo, a software bloating system that they see as against software ethics that needs to be removed. Moreover, the idea of recognition in competitiveness is very distinguishable within the scenes walls, the cracking of the game is the game for them. The added pleasure of cracking puzzle-like DRM blocks to then release publicly and be prized/recognised as one of the best hackers in the scene is what they aspire.

Looking forward, the scene looks to be slowly losing its momentum, as mentioned before there is only EMPRESS who is creaking Denvuo-protected games. The reality is: the world is getting faster and more complex, it is a reality we all need to learn and accept, even these hackers surely do not have as much time as they would have had it pre-2020. It felt the scene was more vibrant when Conspirasy and Steampunks were driving the train, but I do not believe it to be over at all. We have seen it many times: new and fresh groups and individuals rise to the occasion of cracking and spark the competitive seed withing the scene once again, now especially with the new

world of virtual reality on the horizon, I'm sure hackers would want a piece of that software pie and DRM producers will be working tirelessly to make sure that pie is not shared with any of them.

I believe that the strongest reason as to why video game crackers do what they do is the scene itself. They play the villain in the story that is video game distribution. As mentioned in Chapter 3, most of the people within the warez scene are teenage boys who are fans of comics and are engrossed in the world of fantasy. The world of dragons and kings, servants, and slaves. They feel that having a role within the scene and garnering attention places them in a hierarchy where they reside on top. Especially if you crack Denuvo or any other tough crack, you become a primary figure within the scene. This is also proven with how release groups would decorate their cracked releases with cracktros, .nfo art and lace the cracked game with their signature.

Moreover, the battle EMPRESS is having with Denuvo is a spectacle for the masses. Within the world of EMPRESS, her conquering Denuvo protection is her duty, and she considers herself a hero in her story. To her, Denuvo is a cancer that needs to be removed at all costs, and this plays with the theatrics and aesthesis that comes with the scene. Even the battle for recognition is part of the aesthetics, for it is through competition that EMPRESS and Fitgirl got into a quarrel, Steampunks and Skidrow battled it out through NFOs, all this drama plays in favor to all the viewers and audiences.

On the topic of Empress and gender, it is very interesting to note that a male dominated community has a female as the most famous and notorious cracker. First off Empress could entirely be a male because within the scene anyone could be anything, since it is all anonymous, but for the sake of her online identity we will continue like

she is a female. Not only does she crack Denuvo, but she manages is to crack Denuvo within weeks of the video games official release, breaking into the companies toughest and hardest systems to crack. Moreover, she is heavily opinionated and constantly writes her opinions in her release NFO's with little to no repercussions. This is due to the fact she's the only one capable of cracking do Denuvo within the scene, No matter her opinions, no matter how outrageous they are, the community has no choice to but rally behind her for only she can provide them with what they want.

Finally. I'd like to sign off by pondering a question: given the rise of AI, and how it is assisting in everyday activities, how would the rise of AI help crackers infiltrate into impenetrable protections? And vise-versa, how would companies like Sony us AI to enhance Denovo? Could they create a structure where once a hacker tries to infiltrate a code, the AI would adapt to the hackers methods and block it on all fronts? Maybe move around the vulnerable areas of the code when the cracker gets close? And even from the cracker's perspective, how would they use AI to battle the figurative Denuvo AI?

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