

The Effects of Cheats in Anti-Cheat Protected Servers/Games

Abdallah Abdelwahab Mohammed
IA 680 – Seminar in Information Assurance
St. Cloud State University
St. Cloud, United States
aomohammed1@stcloudstate.edu

Abstract— *Within the realm of online competitive videogames, there are bound to be cheaters. There exist groups of individuals out there who constantly discover and dig for ways to gain an unfair advantage in online play. The cheaters look for an upper hand over the other players by having a steadier aim, see things others cannot, infinite ammunition, or misusing a bug that leads them to being invincible. Online games, especially competitive ones, generally have an Anti-Cheat software in place to protect the server against cheaters, but how secure is it. The main objective of the paper is to identify key scenarios into what a user recognizes and experiences in terms of being exposed to cheats, to possibly aid in the creations of a more secure Anti-Cheat software for developing existing/future studios.*

Keywords— *cheating, anti-cheat, protected servers, vulnerability, integrity, data confidentiality, online security*

I. INTRODUCTION

The definition of cheating is the act dishonestly or unfairly in order to gain an advantage, mostly existent within a game or during an examination. The idea of cheating was invariably existent in competitive sports, that could be a game of poker, golf or a game of Quidditch [1]. Most often, cheating is present where there is a prize at stake.

The previously mentioned examples mostly fall under offline cheating. In today's era, there exists online cheating, where the contrast is notable. In the real world of offline cheating, the repercussion for such an act of cheating has been in place from the beginning of time, and the laws that regulate cheating are tactile.

Meanwhile, in the online world, it is fairly new and lacking most of the regulations from the offline world. The obscurity factor is a big reason why many tend to do the heinous act. On top of that, cheating in the online world is becoming more straightforward to do, with scripts deployed in just a

button-click away. Availability of cheat software are increasing by the day. Resulting in honest players having a bad experience and distaste from a lobby where a cheater takes over.

II. BACKGROUND

Cheating comes in many forms within the online world. In order to put cheating in to play, a spectrum of types of cheat is constructed. (See Fig. 1. for the constructed spectrum.)

Within the spectrum, four aspects of cheating is covered.

The first being, *Exploitations*. Which is the least of worry from the spectrum. By definition, an Exploit is the use of a bug or glitch by a player to their own advantage in a manner that is not intended by the game developer. [2] Examples of Exploitation cheats include: duping, twinkling, safe zone abuse, pixel walking and different instance of cheesing. Typically, an exploitation is not a matter to stress about, until monetary incentives are involved.

The second in the spectrum being *Automation*. This is mostly acceptable in single-player games that are grind-heavy. But in games with competitive aspects to it, this is taken very seriously. Examples of Automation cheats include: Aim-bot, Trigger-bot, Macroing, Botting or processes related to a sequence of repetitive key or button presses.

Third being *Overlays*, which are cheats that display data about the location of other users, items, health or any type of status in a game world. This is very sensitive information that is can make a huge different in competitive play. It is as if being able to see an opponent's hand in a game of poker.

Examples of Overlay cheats include: Chameleonhack, Inventory Info or ESP.

The fourth and last is *State Manipulations* (S.M.), these are the most obvious and dangerous type of cheat. Since it is obvious, these are not likely to happen in a competitive environment but common in normal matchmaking, Examples of S.M. cheats include: Teleportation hacks, Speedhack, Noclip or anything applicable to changing values of a user.

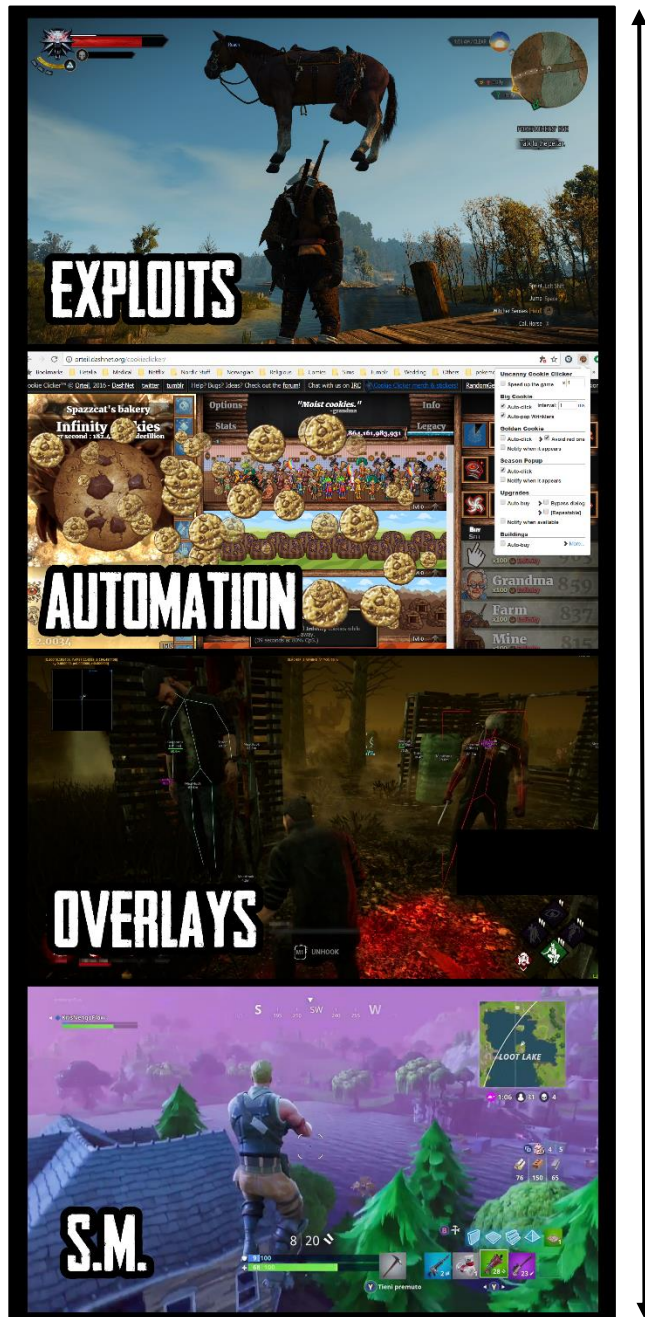


Fig. 1. Cheat Spectrum [3,4,5,6]

A. The Importance of User Experience

Predominantly, a game's experience is shaped around the player. In order for a game developing studio or publisher to make any revenue, the player's retention rate is crucial, and that is judged by player's experience within the game environment. So, the target is to receive positive reviews about a game.



Fig. 2. Valve's Portal 2, Reviews [7].

Figure 2 shows the game *Portal 2*, published and developed by Valve. The statistics show that there are 139,478 positive reviews and only 1,914 negative reviews, with a 97.28% overall. This is the most top-rated online game on the Steam platform [8], with 1,365 active players despite being released in 2011.



Fig. 3. Avalanche Studios' Just Cause 4, Reviews [9].

Figure 3 shows the game *Just Cause 4*, published by Square Enix and developer by Avalanche Studios. The statistics in this game show that there are more negative reviews than positive. This game was recently released in December of 2018, with only 300 players currently in-game.

B. The Main Terminologies

It is integral to understand three terms before proceeding with the experiment. The terms define the roles that act in decreasing the enjoyment of most player experience and/or the game design of a game developing studio/publisher. This part of the paper will cover the origin of each role, the potency, as well as the ease of access of said roles.

- “*Hacker*” — this actor creates the main feature in which the software is used for, they also discover injection techniques to bypass the existing Anti-Cheat system and get the hack running into the game’s official servers. They also are behind the Research and Development phase for the cheats.
- “*Provider*” — this actor acts as the man-in-the-middle between the hacker and cheater. They oversee the distribution phase. Providers handle the marketing and branding of the cheat scripts, as well as, taking on the role of community manager and payment gateways. Generally, well-branded providers localize their presence and expand their reach to potential cheaters.
- “*Cheater*” — this actor is the consumer and user. They are the ones who act on the game environment and use the software supplied by the hackers.

Three different profiles can be identified within a hacker role.

Starting from the most common type, the *scripters*. They make up most of the hackers. Since we mentioned earlier that they are behind the Research and Development of cheats, they often wait for game updates so they can dissect the game files in order to create scripts for easy-to-use cheats.

Moving on to the *senior-hackers*, they are more experienced and go on to creating commercialized cheats that are feature-rich and expensive. It is common for senior-hackers to have a history in the software engineering field.

The last type of hacker is the *researchers*, usual work in teams to reverse engineer a game using a handful of tools and software. The main different between a senior-hacker and a researcher is that a researcher's focus is to publish a proof of concept as a real researcher would do.

Cheaters come in different profiles as well. The most popular being the *griefers*. They are cheaters who derive pleasure primarily or exclusively from the act of annoying other users. Since they do not seek glory, they are usually discouraged by in-game penalties, such as a ban from the server.

Next profile would be the *casual-cheaters*, who would like to make the game a more pleasant experience for themselves. Their intention is not to spoil the other players' experiences, but it usually ends up with negative feedback from the rest of the lobby. It goes like the saying, “*Once a cheater, always a cheater.*”

Following up to the casual-cheaters are the *achievers*. They are cheaters who would like to reap all the glory and come out victorious in competitive play without the repercussions of getting caught in doing so.

Finally, the last profile is often referred to as the *vigilantes*. They are the casual players that often end up becoming a victim to cheats, then proceeding to search the web for a script in order to seek vengeance for the unpleasant experience that occurred to them. The background of player who end up becoming a vigilante, come from a high level of loyalty to the developers of the game. Vigilantes feel the need to cheat so make the environment even.

Towards the end of the paper, there will suggestions, from the users who filled the questionnaire, for how an Anti-Cheat software to improve in order to improve protection. As a side note, it is important to differentiate these cheaters since some of them need to be blacklisted from the

official servers for good; While others, would need to be in a protected server and given a consistent pleasant experience to be not have any vigilante tendencies.

The last role, certainly making it easy for cheaters to find hacks are the providers. There are three methods of acquiring cheats from the providers.

The most advertised and easiest way to find free cheats are from the *open-communities*. These communities a common ground for beginner-level hackers to learn how things work in the cheat world. Registered users can also become approved sellers and offer some cheat or a server for a price. Below is an example of a rank boosting service offered by a member in the MPGH open-community.



Fig. 4. An example of a service offered by the user CopyrightWalrus [10]

Next comes the cheat-publishers that advertise and commercialize paid cheats for the end user. Their websites are just an easy to find as the open-community ones. Cheat-publishers can take any type of payment gateway from Venmo to Crypto. There are many of them across the web, one popular one is AIMWARE [11].

“AIMWARE is a cheat provider that support different games and is present on the market for over 4 years, our cheat packages are steadily added and promptly updated so that we can fit all of our customer's needs.

In fact, our software line is specifically made to support different playing styles such as legit and rage! Our software is easily customizable in all its mechanics.” [11].

The final type of cheater provider is the *closed-communities*. They are tough to get in since they are strictly invite-only based on reputation, a vouch from an existing trusted member or an infamous positive reputation from other communities. Most of the cheats within a closed-community are in limited runs with a set number of buyer space. In some cases of closed-communities, there are very exclusive cheats where users would pay over \$2500 dollars to get a custom cheat tailored to their liking and utterly undetectable by the respected Anti-Cheat software.

III. LITERATURE REVIEW

To further understand the research being conducted, as well as, finding two functional cheats to conduct the experiment in the later stage of this paper, a popular competitive game where a notorious Anti-Cheat system is present must be found; Alongside a provider offering a cheat to it.

Being familiar with the competitive games already, the process of skimming through different providers was simple.

The game, *Team Fortress 2*, a popular competitive FPS (First-Person Shooter) game, was chosen. The follow description of competitive play was taken from the game’s Steam store page:

“Community competitive play in Team Fortress 2 refers to organized gaming done for the purpose of playing through skillful competition, practiced teamwork, and self-

improvement, especially in a league setting. There are 3 main competitive formats in TF2 - 6v6 (commonly referred to as '6s'), Highlander (commonly referred to as 'HL'), and Prolander (also known as 7v7). Other formats of competitive play include 4v4, Ultiduo, and Bball, which are played in more casual competitions, rather than prized and more serious competitions.” [12].

The provider, *LMAOBOX*, features a list of premium Team Fortress 2 cheats that is an instant access, pay once and keep forever deal for \$20.

The following is the list of features that comes with the LMAOBOX Project: [13]

- **AIM-BOT:**

- **Aim Bot** - Automatically aim at enemy
- **Aim Key** - Only automatically aim if you hold down the assigned key
- **Aim Fov** - Only aim at targets within a specified fov
- **Priority** - Who to aim at (Closest to your crosshair, most health, least distance, etc.)
- **Target Lock** - Dont change target when already locked on to one
- **Aim Position** - Select preferred body part
- **Aim Assistance Only** - Only automatically aim when the mouse is moving
- **Slow Aim** - Smooths Aimbot to make it look human
- **Auto Shoot** - Automatically shoot when active
- **Silent Aim** - Makes Aimbot invisible for you and for spectators
- **Projectile Aimbot** - Aim with projectile weapons with time and gravity prediction
- **Legit Projectile Aimbot** - Draws predicted target position
- **Melee Aimbot** - Automatically attack enemies with your melee weapon
- **Medigun Aimbot** - Automatically aim with the medigun to heal your teammates
- **Medigun Uber** - Automatically pop uber in dangerous situations
- **Spread: Max distance** - Ignore any target outside set distance with spread weapons
- **Aim When Reloading** - Aim while reloading
- **Crit Hack** - Decide when you want your weapon to fire critical hit
- **Crit key** - Force crit when you hold the key
- **Melee Crits** - Almost always melee crit
- **Aim Sentry** - Aim at sentries
- **Aim Other Buildings** - Aim at dispensers and teleporters
- **Aim Stickies** - Aim at stickies to destroy them
- **Aim Sentry Buster** - Aim at sentry buster in MvM
- **Ignore Steam Friends** - Ignore steam friends
- **Ignore Deadringer** - Ignore deadringered spies
- **Ignore Cloaked** - Ignore cloaked spies
- **Ignore Disguised** - Ignore disguised spies
- **Ignore Taunting** - Ignore taunting players
- **Ignore Vacc Ubercharge** - Ignore players with vaccinator ubercharge

- **Ignore Teammates** - Do not use weapons with friendly effect on teammates (crossbow etc.)
- **Prefer Medics** - Rather shoot at medics than at other classes
- **Sniper: Zoomed Only** - Only shoot when you are scoping
- **Sniper: Auto Zoom** - Automatically zoom before shooting
- **Wait For Charge** - Wait for enough charge to one hit kill (Also for ambassador spy)
- **BackTrack** - Aim at past target position
- **No Spread** - Disable weapon inaccuracy
- **No Recoil** - Disable weapon knockback

- **TRIGGER:**

- **Trigger Key** - Only trigger if you hold down the assigned key
- **Auto Backstab** - Automatically backstab enemies when possible
- **Disguise After Attack** - Automatically disguise after attack
- **Ignore Razorback** - Do not backstab sniper with the razorback
- **Auto Detonate Sticky** - Automatically detonate stickies as demoman
- **Auto Detonator** - Automatically detonate flare as pyro
- **Auto Airblast** - Automatically reflect/destroy projectiles as pyro and engineer
- **Auto Vaccinator** - Auto pick ubercharge resist type
- **Auto Ubercharge** - Automatically triggered ubercharge when needed
- **Health Percentage** - Activate Ubercharge when HP gets below this percentage
- **'Activate Uber' Voice Trigger** - Activate Ubercharge if told via 'Activate Uber' voicecommand
- **Trigger Shoot** - Automatically shoot when an enemy passes under your crosshair
- **Trigger Shoot key** - Only trigger shoot if you hold down the assigned key
- **Trigger Melee** - Automatically attack with melee when enemy is hitable
- **Trigger Position** - Only shoot when bodypart passes under your crosshair
- **Trigger Shoot Delay** - The amount of ms to wait before shooting
- **Sniper: Shoot Thru Teammates** - Shoot through teammates or not
- **BackTrack** - Shoot at past target position

All the Aim-bot and Trigger-bot cheats fall under the Automation type of cheat under the spectrum created earlier.

- **ESP:**

- **Players** - Show players through walls
- **Enemy Only** - Only show enemy players through walls
- **Centered** - Show text information centered
- **Friends** - Mark Steam friends and lobby members with different color
- **Name** - Display player name
- **Steam** - Display steam ID

- **Health** - Display health in bar, value or percent
- **Weapon** - Display current weapon
- **Ubercharge** - Display ubercharge percent
- **Distance** - Display distance between you and the enemy
- **Class** - Display class
- **Box** - Display a box around the player in 3D, outlined or solid
- **Skeleton** - Display player model skeleton
- **Glow** - Display glow in team or health color
- **Glow Size** - Glow effect outline size
- **View Angles** - Draw view angles on snipers or all players
- **Spy: Anti-Disguise** - Reveal the Spy behind disguise
- **Hide Cloaked** - Do not draw ESP on invisible spies
- **Buildings** - Display buildings through walls
- **Buildings Name** - Display building name
- **Enemy Only** - Display only enemy buildings
- **Health** - Display building health in bar, value or percent
- **Box** - Display a box around the building in 3D, outlined or solid
- **Glow** - Display glow in team or health color
- **Aimbot Fov Range** - Always draw the set aimbot fov
- **Aimbot Target Highlight** - Highlight target the aimbot wants to shoot at
- **Crit Indicator** - Display number of crits
- **BackTrack Indicator** - Draw backtrack history as player chams or points
- **Text Color** - Display text in white or team color
- **Ammo/Medkit** - Display Ammo/Medkits
- **MvM Money** - Display MvM money
- **Power Ups** - Display power ups
- **NPC** - Display Non-Player characters
- **Projectiles** - Display projectiles
- **Capture Flag** - Display capture flag

● **RADAR:**

- **Radar** - Toggle radar
- **Enemy Only** - Only display enemies
- **Radar Type** - Square or Circular radar
- **Radar Size** - Radar size between 20 and 600
- **Icon Style** - Choose from 2 different icon styles
- **Icon Size** - Icon size between 6 and 32
- **Icon Background Size** - Icon background size between 0 and 20
- **Healthbars** - Display health bars
- **Ammo/Medkit** - Display Ammo/Medkit
- **Projectiles** - Display projectiles
- **Spy Camera** - Toggle spy camera
- **Camera Mode** - Toggle what to display on spy camera
- **Camera Size** - Camera size between 1 and 100
- **Camera FOV** - Camera FOV between 60 and 120

● **VISUALS:**

- **Colored Models** - Toggle colored models (aka chams)
- **Draw Mode** - Toggle between always, when invisible and when visible
- **Draw Style** - Toggle between flat and textured
- **Enemy Only** - Only display enemies
- **Friends** - Different color for friends
- **Classic Wallhack** - Classic players wallhack
- **Ammo/Medkit** - Display Ammo/Medkit
- **Projectiles** - Display projectiles

- **Blue Team Color** - Custom Blue team color
- **Red Team Color** - Custom Red team color
- **Blue Team (Invisible)** - Custom Blue team color when invisible
- **Red Team (Invisible)** - Custom Red team color when invisible
- **GUI Color** - Custom lmaobox GUI color
- **Thirdperson** - Toggle third person mode
- **Thirdperson Key** - Thirdperson toggle key
- **No Hands** - Remove local player hands
- **No Scope** - Remove sniper rifle scope
- **No Zoom** - Remove sniper zoom effect
- **Sky Box** - Set custom map sky box
- **Enable Custom Fov** - Toggle custom fov
- **Custom Fov Value** - Custom fov value from 75 to 120
- **Night Mode** - Customize map lighting level

All ESP and Radar cheats are placed under the Overlay type of cheat under the cheat spectrum.

● **MISCELLANEOUS:**

- **Name Stealer** - Automatically steal another players name
- **Name Linebreak** - Add line break for every space in your name
- **Chat Spammer** - Choose between empty lines, multiple lines and simple line
- **Bunny Hop** - Keep jumping by holding spacebar
- **Auto Strafe** - Strafing mid air to gain moving speed
- **Auto Voting** - Automatically vote Yes or No during votekick
- **Detect SMAC** - Prevent detections on servers with running Source-Mod-Anti-Cheat
- **Anti Aim** - Makes other cheaters harder to hit you
- **Anti Aim (Pitch)** - Anti-Aim type for X-Angle (Up, Down, Center, Fake, Spin-Bot)
- **Anti Aim (Real Yaw)** - Anti-Aim type for Y-Angle (Left, Right, Back, Spin-Bot, Jitter)
- **Anti Aim (Fake Yaw)** - Anti-Aim type for Y-Angle (Left, Right, Back, Spin-Bot, Jitter, Forward)
- **Anti Backstab** - Anti-Aim mode to prevent spies from backstabbing you
- **Edge Detection** - Override the best Yaw Anti-Aim when near walls
- **Aim Resolver** - Use if enemy uses fake anti-aim
- **Fake-Lag** - Makes you harder to hit by increasing your outgoing lag
- **Fake Latency** - Increase backtrack history
- **Hack Menu Key** - Choose a custom key to open and close the lmaobox menu
- **Display Player List** - Display player list that allows you to set Aimbot priority, change ESP color and more
- **Lobby List** - Share your lobby with other players
- **Follow Bot** - Follows nearby players
- **Target Distance** - Distance between you and your follow target
- **Activation Distance** - Don't follow players beyond this distance
- **Weapon Switcher** - Automatically switch weapons after refilling ammo (Useful for follow bot)

● **SUPPORTED ANTI-CHEATS:**

- VAC
- SMAC

The *LMAOBOX Project* software features stealth from the following Anti-Cheat software:

1. “Valve Anti-Cheat”

Valve’s Anti-Cheat (VAC) systems works by detecting cheats using their cheat signatures. In which they claim that any third-party modifications to a game designed to give one player an advantage over another is classified as a cheat or hack and will trigger a VAC ban. [14]

2. “SourceMod Anti-Cheat”

SourceMod Anti-Cheat (SMAC) system is supposed to protects a game server against common threats, hacks, scripts, exploits, commands, cvars, or cheats currently being used today to cause servers harm. [15]

IV. METHODOLOGY & CHALLENGES

The main focus of this study is to identify key scenarios into what a player sees and experiences in terms of cheats, to aid in verbally financing and creating a more secure Anti-Cheat software for Third-Party companies and/or respected game studios. The first step to achieving this was to skim through several cheat providers and forum postings for relevant competitive functional script to conduct an experiment within an Anti-Cheat protected game/server. This step took time since there were many competitive online games with different Anti-Cheat systems in place. After thorough research and testing out scripts, I was able to discover working cheats that adapted to my cheat spectrum (Fig. 1.). The result was testing two official server instances, in two different games, under two different Anti-Cheat systems, with a full player lobby.

However, I did come across multiple challenges through this project. The first being the hardware and software needed to experiment the downloaded scripts from the providers, which ranged from: purchasing one of the games to be experimented on, purchasing a subscription for the cheat and risking

an account VAC ban or game ban on the respected account. Since of course, the cheat provider could be possibly be selling an outdated cheat that has been patched; Some cheat providers from an open-community may even create fake testimonials just to generate sales.

Nevertheless, I took the important steps to research the trusted providers early-on than having to risk falling behind on research time.

I based my sample sizes with the combination of two different competitive online multiplayer games. Since, I wanted to cover more grounds across different Anti-Cheat protection systems in place, as mentioned earlier.

The need for several players in the server is crucial in finding the best results for the experiment.

Based on the context of this experiment and study. I, the researcher, will use Convenience sampling to attain the results. The participants from both, Counter-Strike: Global Offensive (CS:GO) and Deceit, will be asked to take a short survey based on their experience with being in the same lobby as a cheater. The process will be repeated several times across from different instances and servers until enough people are interviewed. The subjects within both games are perfect victims since they play on official server matchmaking, which is under the protection of at least one Anit-Cheat software in place. The participants will be asks to participate using in-game text chat, in-game voice chat or being contacted by the researcher via the recent players list. Specifically within CS:GO, I have further downed the sample size to avoid bias, since I will be selecting the players who are in the opposing team who will most likely be losing due to being pitted against high improbable odds.

For sample selection, I was considering Snowball sampling since a player in the server who I handpick may nominate a friend who was in the same server, who also experienced being a victim to the cheat. But since I have access to the list of

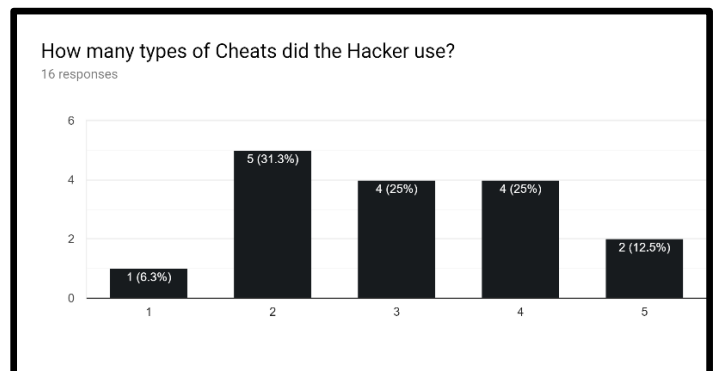
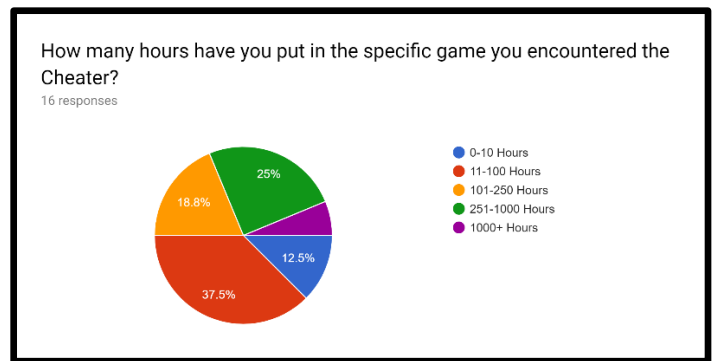
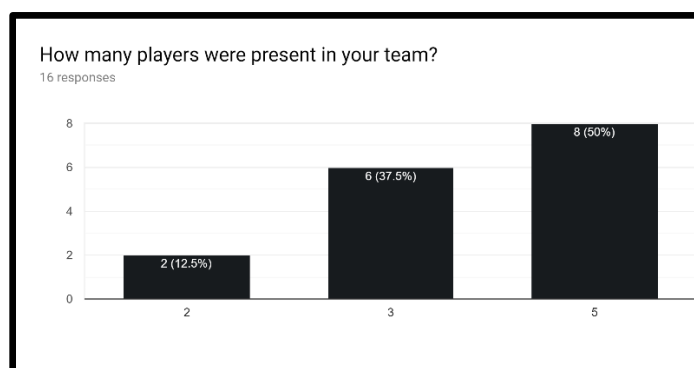
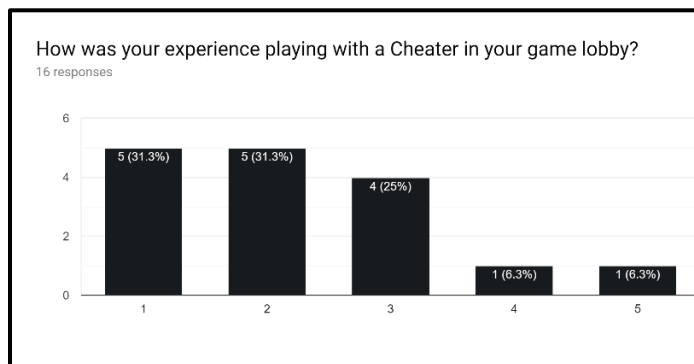
players in the server I join, it will be more reliable to go ahead with Convenience sampling.

After the match ends and the test is over. I will invite each player in my lobby for the interview; Based on their availability and willingness to take part.

The limitation for selecting samples within the game *Deceit*, is that it may suffer from bias answers, since the five players are put in to two different teams, by secret. Only the “infected” team (of two people) can tell who is “innocent” (the three remaining players), which could possibly make the teammate of the cheater a more pleasant experience. Thus, changing out the results. However, this is countered using more specific questions in the questionnaire.

V. RESULTS

(Appendix A shows screenshots from the recoding of game #1 for *Deceit*, where part of the results were taken from that sample. The link to the full video is in the reference section of the paper).



Can you list them?

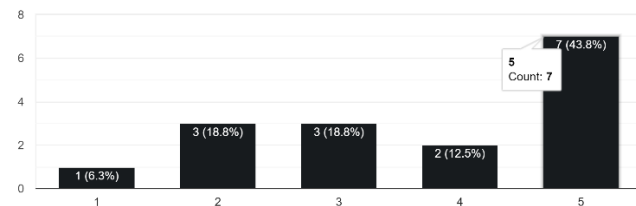
1. "aim and teleport"
2. "AIMBOT + WALL"
3. "wallhack, aimhack, teleport hack"
4. "aimbot"
5. "Pretty sure the cheater was using ESP, Aimbot, Wall-hack and Noclip."
6. "Constant headshot aimbot and flying across the map"
7. "fly cheat, infinite ammo, no recoil hack"
8. "speed hack, aimbot"
9. "The hacker used everything from seeing behind walls, always headshots, flying around, teleporting to teammates and not having any recoil when shooting lol, I never experienced anything like it in CSGO, only heard of it..."
10. "Noclip, Player Teleportation, Aimbot, & Infinite Ammo."
11. "I think he used everything like he was invisible sometimes, had amazing aim, shot me thru the wall, can tele between me and my teammates, and also seemed to always be shooting without having to reload!"
12. "The tele hack, aim hack and no recoil hack."
13. "This guy was in my team but still kept killing me with aimBot and flying around outside me and coming out of nowhere. So, aimBot, Flying and TP to player...."

14. "Unlimited ammo, no spread, aimhack and teleport."

15. "chameleonhack probably, auto aim, no recoil and teleportation."

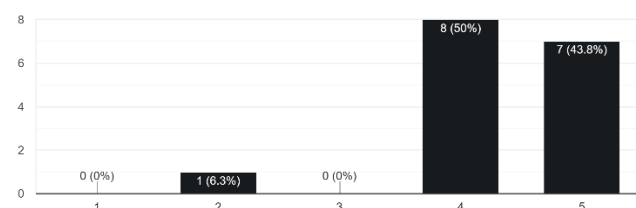
Did you think you were secure with the game's official Anti-Cheat system in-place?

16 responses



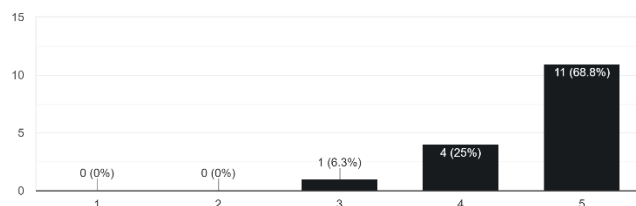
How important is an Anti-Cheat software to you, when connecting to a server?

16 responses



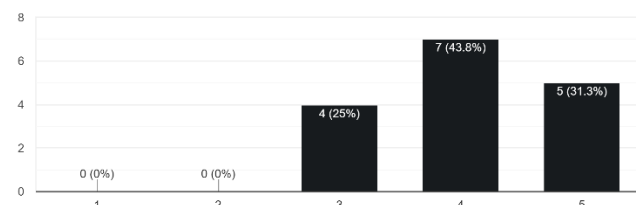
How detectable do you think an Anti-Cheat software should be?

16 responses



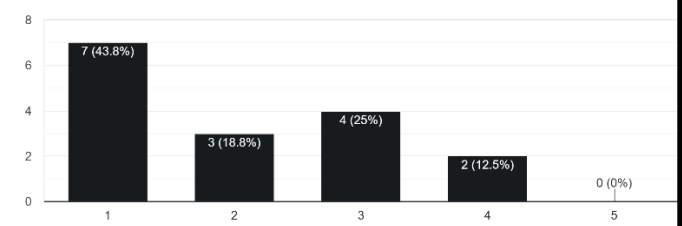
How comfortable are you with a detectable Anti-Cheat?

16 responses



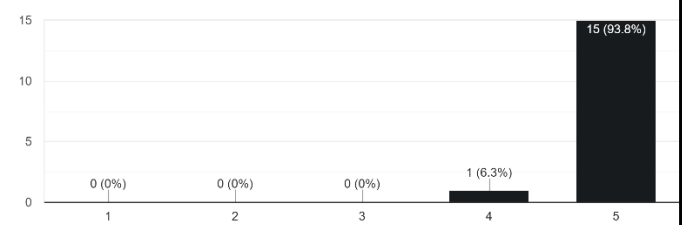
Would You Trust A Third-Party Anti-Cheat (such as SMAC) in this Role?

16 responses



Do you think the game should improve in their Anti-Cheat software?

16 responses



In your opinion, what do you think should be done for an Anti-Cheat software to improve?

1. "i played this game today for the first time with my friend and he said he saw a hacker before but new people like me need to play more see if there are more hackers.. the anticheat software needs to improve on looking who has a cheat running while connecting maybe"
2. "I STRONGLY BELIEVE VAC SHOULD BE IMPROVED SINCE IT HAS BEEN EXISTING FOR AGES"
3. "people who develop anticheat need to regularly update software, and maybe more people to hire"
4. "i dont know but they need to improve"
5. "I have played multiple multi-player games in the past and from my experience Anti-Cheat softwares should really step-up their game in terms of research. It is good to spy on existing/upcoming cheats in order to be on the same caliber of the hack creators."
6. "Thanks for taking action to this. 🤝"
7. "The game will decrease in playerbase if nothing is done to improve Valve's anticheat aka VAC, it definitely is not fair since it was under a VAC-protected server. More emphasis on the anticheat team devs!"

8. *"if Anti cheat doesnt improve people will go play other secure games and game industry will start losing money"*
9. *"maybe every week they need to update anti cheat software and start punishing cheaters hard"*
10. *"If this guy got in a secured VAC CSGO server and did that then others can do the same. CSGO also has alot of competitive play and Esport is big here, especially in my country Poland! The community here really loves CSGO, so this shouldn't ever happen. They need to make the hacks more detectable I think"*
11. *"Automaton, the developers of Deceit really need to fix their relationship with EAC to start banning these cheaters. I know Deceit is a F2P game, so they should look into somehow blacklisting these hackers at the verey least."*
12. *"I am not sure what deceit uses for anti-cheat software but they need to get a new one maybe!"*
13. *"EAC needs to check the way a player aims or track the movements. - JeremyDan"*
14. *"its stupid how can this be possible in an old game like DECEIT, I have been playing for years and they never improved. Always teamkill and sometimes hackers. They hav to have a different anticheat or maybe add more on EASY AC!!!!"*
15. *"Deceit needs get different staff for the anticheat. Luckily, I was not voted out so that's good and managed to escape even after being downed so many times."*
16. *"eac for deceit is pretty bad, I see many hackers especially on asian official severs. they have to get a different one maybe punkbuster like ea and ubisoft games."*

(Appendix B shows the list of questions for the questionnaire).

VI. CONCLUSION

From the responses collected from the questionnaire we can analyze and conclude the following: -

- Players most did not enjoy playing in the same lobby as a cheat and it mostly ruined this experience.
- The questionnaire was a success since all the participants agreed to take time and fill out the survey.
- Most players who participated have put 11-100 hours in the respected game.
- They analyzed mostly 5 cheats, which shows how much players understand the types of cheats.
- Most of their responses were accurate and some of them were spot on.
- The majority thought there were secure with the game's official Anti-Cheat system (VAC/EAC).
- It is important to a big part of the players that there is an Anti-Cheat system in place, thus wanting to play fairly and as intended by the developers.
- The respondents all strongly agreed that an Anti-Cheat software should be as detectable as it can. Shows us room for improvement.
- More than half of the players thought they were secure while playing on official competitive servers under the Anti-Cheat systems in place.
- The players felt that Anti-Cheat software are very important to them and they would like to see it improved somehow.
- With no surprise, all the players were comfortable with an Anti-Cheat software in-place.
- When asked if Source Mod Anti-Cheat were to launch an updated Anti-Cheat that would publicly-available releases, about how SMAC

can access your potentially sensitive files, ease their concerns, they mostly didn't mind and trust the confidentiality of their files with an Anti-Cheat software.

- The respondents mostly trust a Third-Party software (SMAC) to have availability to their files.

In conclusion, they all felt that the games could improve their Anti-Cheat system by Cheat Detection while establishing a connection to the server, put more emphasis in the Anti-Cheat security team, blacklisting hackers with EAC instead of using a Third-Party to do so (such as SMAC), analyze how players track other players as well as monitor their movement and speed, possibly learn from other Anti-Cheat systems and share resources and finally change the Anti-Cheat system if it the hackers are always one step ahead.

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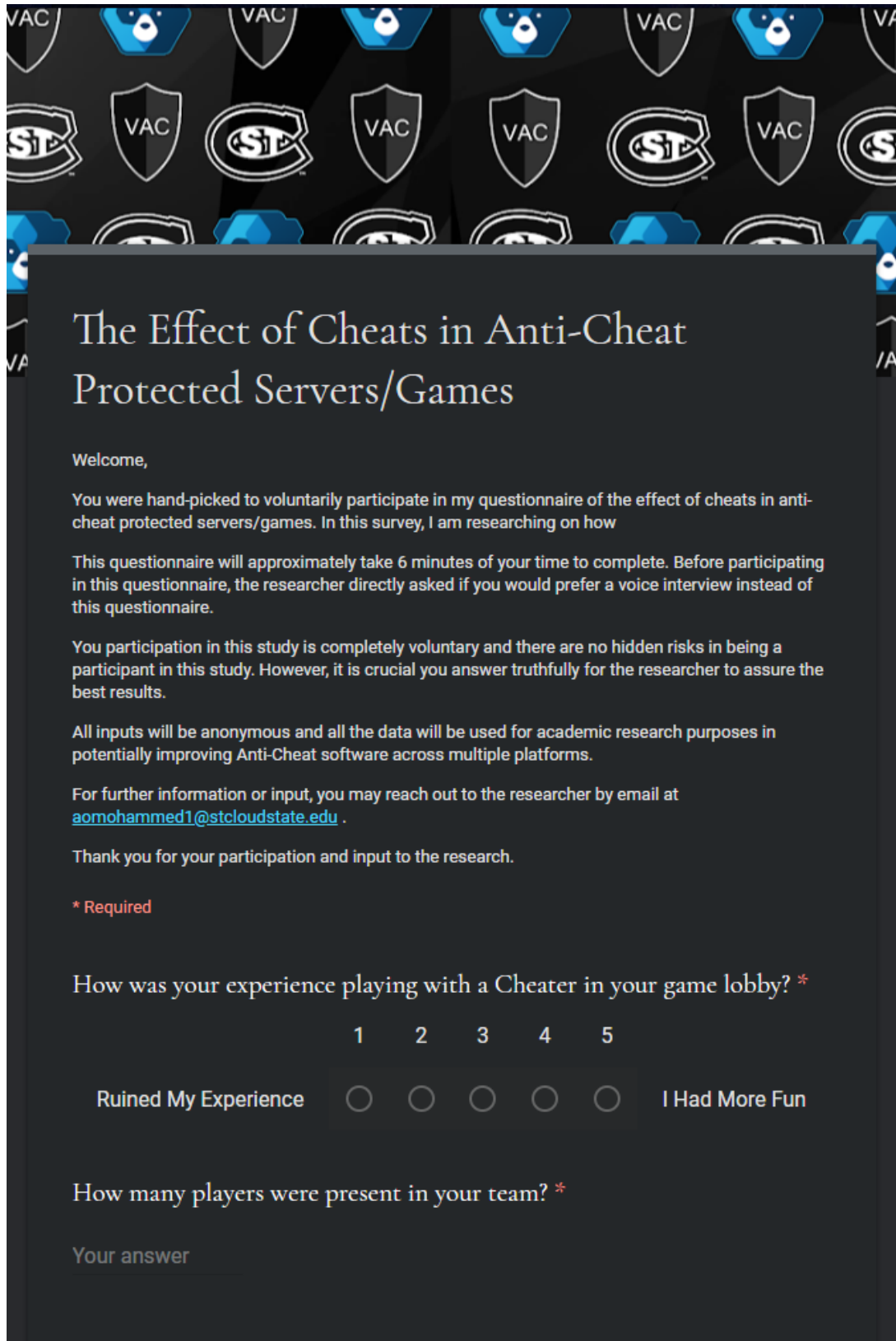
Appendix A

Deceit game #1. (2019) [16].



Appendix B

The Effect of Cheats in Anti-Cheat Protected Servers/Games. (2019) [17].



The screenshot shows a survey interface with a dark background and a repeating pattern of VAC and Steam logos. The survey title is 'The Effect of Cheats in Anti-Cheat Protected Servers/Games'. The welcome message states that the participant was hand-picked to participate in a questionnaire about the effect of cheats in anti-cheat protected servers/games. It mentions that the survey is approximately 6 minutes long and that the researcher has offered a voice interview as an alternative. The survey is voluntary and aims to improve Anti-Cheat software. Contact information for the researcher is provided. The first question is 'How was your experience playing with a Cheater in your game lobby?' with a 5-point scale from 'Ruined My Experience' to 'I Had More Fun'. The second question is 'How many players were present in your team?' with a text input field.

The Effect of Cheats in Anti-Cheat Protected Servers/Games

Welcome,

You were hand-picked to voluntarily participate in my questionnaire of the effect of cheats in anti-cheat protected servers/games. In this survey, I am researching on how

This questionnaire will approximately take 6 minutes of your time to complete. Before participating in this questionnaire, the researcher directly asked if you would prefer a voice interview instead of this questionnaire.

You participation in this study is completely voluntary and there are no hidden risks in being a participant in this study. However, it is crucial you answer truthfully for the researcher to assure the best results.

All inputs will be anonymous and all the data will be used for academic research purposes in potentially improving Anti-Cheat software across multiple platforms.

For further information or input, you may reach out to the researcher by email at aomohammed1@stcloudstate.edu.

Thank you for your participation and input to the research.

* Required

How was your experience playing with a Cheater in your game lobby? *

1 2 3 4 5

Ruined My Experience ☐ ☐ ☐ ☐ ☐ I Had More Fun

How many players were present in your team? *

Your answer

How many hours have you put in the specific game you encountered the Cheater? *

- ☐ 0-10 Hours
- ☐ 11-100 Hours
- ☐ 101-250 Hours
- ☐ 251-1000 Hours
- ☐ 1000+ Hours

How many types of Cheats did the Hacker use? *

	1	2	3	4	5	
One	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Five

Can you list them?

Your answer

Did you think you were secure with the game's official Anti-Cheat system in-place? *

	1	2	3	4	5	
Not At All	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Yes, I Had Never Seen A Cheater Before This Encounter

How important is an Anti-Cheat software to you, when connecting to a server? *

	1	2	3	4	5	
Irrelevant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Critically Important

How detectable do you think an Anti-Cheat software should be? *

	1	2	3	4	5	
Least Detectable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Most Detectable

How comfortable are you with a detectable Anti-Cheat? *

If an Anti-Cheat system was promoted as highly detectable (kernel mode driver, secure boot, access to storage files, etc), how comfortable will you be with that software?

	1	2	3	4	5	
Not Going To Use My Computer Machine/Console System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Run Whatever I Want

Would You Trust A Third-Party Anti-Cheat (such as SMAC) in this Role? *

If Source Mod Anti-Cheat were to launch an updated Anti-Cheat, would publicly-available releases about how SMAC can access your potentially sensitive files, ease any of your concerns?

	1	2	3	4	5	
No Change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	All My Worries Have Disappeared

Do you think the game should improve in their Anti-Cheat software? *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Agree

In your opinion, what do you think should be done for an Anti-Cheat software to improve? *

Give any input on how EAC, VAC, Battle-Eye, etc. can improve when it comes to detecting cheats.

Your answer

SUBMIT

Never submit passwords through Google Forms.