Using Facebook In The Onion Router

Joanna Marie Pauline T Hipolito
Makati City, Philippines
jthipolito@student.apc.edu.ph

Mikhaela Francesca G Pachico
Parañaque City, Philippines
mgpachico@student.apc.edu.ph

Monique Isabela S Jovellano
Mandaluyong City, Philippines
msjovellano@student.apc.edu.ph

Angelica Laurene S Ruiz
Pasay City, Philippines
asruiz@student.apc.edu.ph

***Abstract*—Among the problems that social networking sites are facing in status quo are accessibility and security, or lack thereof[9]. With hackers gaining unauthorized access every day, repressive regimes controlling information access in certain countries and the government spying the user's activities 24/7, achieving privacy becomes a hard task for every internet users. The main target of these hackers and governments is the social networking sites, a platform of social interaction and expression, making its users vulnerable to attacks, restrictions over the contents online, and information manipulation[2]. This leads users to resort to Tor, short for "The Onion Router," which is said to be the best available anonymity network that keeps the activities and locations of the users from unwanted third party[15]. The study aims to characterize the current security problems of social networking sites, get knowledge of the services that Tor has to offer and determine its potential benefits and vulnerabilities**

***Keywords:* Security, Social networking, Privacy, Tor, Internet.**

I. Introduction

Social networking site is one of the least anonymous websites because this online platform is where people create public profiles, share their activities, and even post personal information[1]. However, in 2014, Facebook which is the most widely used social network provided a second URL for their site that can only be accessed through Tor[1], or The Onion Router, an open-source software program that was created in 2002 designed to allow users to log in anonymously from anywhere in the world[5].

Tor is like an ordinary web browser but instead of routing your connection to a direct line, tor routes the data through a series of encrypted computers all over the world, bouncing around different servers before it reaches its host destination[23]. Through this mechanism, it makes the web traffic more difficult for any network spy to monitor and trace the origin of the data[6]. Given that scenario, if a user's actual location is in the Philippines, his online activity may appear to be coming from Brazil or Alaska or any random part of the globe. Therefore, it makes the physical location of the user completely hard to trace, helping people get away from internet surveillance, censorship, and hacking. However, according to a recent study, detection of the Tor traffic is still possible through the use of a blacklist, a list of all known IP addresses that Tor uses and a simple script that generates these addresses in order to check a possible Tor traffic.[24]

But for an entity that is far from anonymous, why did Facebook provide its own site in the anonymous network? According to Alec Muffett, a software engineer at Facebook London, this step was to achieve their long term goal of better accessibility and security for its users[11]. Facebook wanted to be used anytime anywhere and giving tor an easier access to it extends the social network to those who cannot access it due to internet censorship and surveillance, like the countries of China and Iran who are known to restrict access to these social networking sites.

II. Problem Statement

Social media is forming an increasingly central part of how we all communicate. Its online communities carry a strong and influential voice, and there is much to gain from engaging directly with people through these channels – whether that be to reach journal readers, to network with colleagues, or even just to keep up to date with friends and family [20]. It has become a communication tool for individuals who wants to express their personal desires. However, despite the global access to social networking sites, some countries still prevent people from using it via the internet. The main factor as to why they don't allow access is because of internet censorship that a country has been following.

Internet censorship is way for higher and powerful officials to suppress one's freedom of speech online. It also limits access to sites and other resources found in the internet that they believe would affect the image of the government. But as technology advances, the industry has become more profitable, multinational corporations have been quick to bend to the will of corrupt governments and in some cases are the perpetrators of human rights abuses themselves. [16] An example is the creation of the "Great Firewall of China"; a technology used to closely monitor the activity of Internet users and block access to information[16].

On other circumstances, people who doesn't have censorships when it comes to the internet still wants to ensure

their privacy and security from various internet or cyber threats.

The Onion Router (Tor) network, as discussed in the previous chapter, is an open-source program that allows people to improve their privacy and security on the internet[6]. Individuals use Tor to keep websites from tracking them and their family members, or to connect to news sites, instant messaging services, or the like when these are blocked by their local internet providers[6]. Tor developers, on the other hand, have stated that their software, or any software for that matter, is not foolproof because the users can still destroy their own anonymity with just a single mistake. Common mistakes are the misconfigurations when running the browser tool which allows hacker to penetrate and get enough information for exploitation[15].

Tor has been a subject of debate to many because of the controversies surrounding it involving illegal acts. Being that as a stigma to the browser many people seem to doubt the positive effects of it to the society. However, it comes to light that a powerful social networking site has given way. Facebook currently has easier access in Tor browser by providing its own 'hidden service'[10]. According to Muffett, Tor challenges the security mechanism of Facebook. [8] For example, from the perspective of the security system of Facebook a person who seems to be connecting from a certain place at one moment may next appear to another place different from the first. It appears that a hacked account was accessed but for Tor it is a normal phenomenon. [8]

Eleanor Saita explained that not all users want or can access social networking sites without using Tor. [8] There is a probability that the reason is it can only be the way for an individual being threatened or tracked to operate a social media account or other web pages without being located. Another, is the vulnerability of social networking sites to hackers.

Hacker is a term used by some to mean "a clever programmer" and by others, especially those in popular media, to mean "someone who tries to break into computer systems" [19]. All hackers have different motives when it comes to hacking a system. However, it still evades the privacy and security of a person.

Other examples of users who are cautious of attackers are activists, journalists, abuse victims, etc. resulting to being dependent to the Tor browser. Moreover, Eva Galperin stated that some people with known accounts still wants to remain known but needs privacy when it comes to their locations and other personal information. [8] The only solution that a person can think of is to just leave the social networking world. However, leaving can't be the option because the vast majority of the audience is in Facebook. Some experts also say that it hard to use social media while completely anonymous because it defeats the purpose. [12] That can be a reason why some other sites for social networking are still not embracing the existence of Tor.

Furthermore, Facebook's main reason for letting Tor access their site is to help prevent evildoers from watching Facebook users use Facebook. [9] Still there are organizations that's against the idea of Tor networking. Not only on making social media accessible to it but in many other aspects specifically in politics and business.

National Security Agency (NSA) an organization that leads the U.S. Government in cryptology that encompasses both Signals Intelligence (SIGINT) and Information Assurance (IA) products and services, and enables Computer Network Operations (CNO) in order to gain a decision advantage for the Nation and the allies under all circumstances. [21]

The efforts of NSA in decrypting the information inside the Tor can be a hurdle for the users of the network because it has become the high priority target. NSA's way of handling the anonymous network is to exploit the Tor browser bundle, a collection of programs designed to make it easy for people to install and use the software. [13] The trick identified Tor users on the internet and then executes an attack against their Firefox web browser. [13] A weakness of Tor identified by NSA is that a feature wherein all Tor users look alike on the internet making it easier to differentiate them with the other web users. During the process they can already minimize the scale of what they are trying to find.

With the continuing actions made by NSA it is possible that Tor is still a vulnerable tool when it comes to anonymity. If the developers of the network can't seem to change the system of security and privacy running in the background of the network, then there is a large possibility that Tor may not anymore be capable of serving its main purpose. Thus, it may affect the other sites that has openly made access in Tor.

III. Results and Discussion

Facebook is the first Silicon Valley giant that publicized its collaboration and venture with Tor. For them it would be hard to identify legitimate connection resulting to launching its own special hidden service accessible only by using Tor that connects directly to the server of Facebook. The address that was provided is: https://facebookcorewwwi.onion/. Since there is an assurance that a user accessing an account is legitimate then Facebook being a hidden service is an effective wait in distinguishing those people with good and bad intentions. [8]

It is still certain that the majority seems to still doubt the probable advantages of using Tor. Looking in a different angle or perspective, Tor can be a useful tool when it comes to preventing hackers in penetrating an individual's personal account. Knowing the process undergoing inside the system network of Tor, then it is safe to say that hackers would have difficulty in being able to crack or determine the security pattern of the site. Also, the tracking of IP addresses of their targets would be laborious due to the high-security system environment of Tor compared to the regular web browsers.

Another special feature of Tor is that it can allow access to all sites available in the browser. It will disregard the firewall that prevents the users to access a censored site. In China, a growing number of people are starting to get familiar with Tor because it can penetrate the infamous Great Firewall of China thus making way to all available sites, particularly social networking sites that has been banned for years.

Data shows that that at least 57% of "active" sites were involved in illegal activities in the Tor browser. [22] Many headlines have reported this as being the majority of Tor is used for illegal purposes, it needs to be remembered that this also means that 43% is being used for legal purposes and 57% is a relatively small majority. [22] Illegal drug transactions, illegitimate pornography, violence and other illegal activities are common. Some may say that the venture of Facebook in Tor can be a downfall but in reality it would be hard for illegal doers to conduct their acts in the platform because Facebook is still public. Tor only prevents the location of the users and all the transactions, posts, messages, and advertisements are still recognizable by Facebook. So once the management detects anomalies then they will automatically shut down and prevent the black market from happening inside their site. Therefore, Facebook or any social networking sites can't possibly be a venue for the black market. However, this is only on the environment of social media there is still no assurance that the black market is not on the other recognized sites by Tor. It is also possible to have their own different "hidden services" inside Tor like the Silk Road. Making it very hard for government officials to conduct investigations.

There are odds that Tor can be misconfigured resulting to the termination of anonymity to sites and being able to be located. Also, the NSA organization that finds a way to decrypt all information in Tor can be disadvantageous. A way to prevent this from happening is to keep the Tor software up to date and to remember that logging into services will let them see the communications that the user performed within their system. [17] Additionally Tor users should be mindful of the fact that an adversary who can see both sides of the connection may be able to perform a statistical analysis to confirm where the traffic came from. [17]

So far, Facebook is the only one that encourages users to use its services via Tor. Implementing a large-scale development can't be done in a single day. Still things are on the experimental stages and there's still a lot of work to do in order for the new system to grow to its full potential. Facebook as being one of the most sought after social networking platform can lead other sites to follow its new venture.

IV. Conclusion and Recommendation

As an online platform for social interaction and expression, social networking sites are entitled to ensure their users' security and privacy.

In this study, Facebook, the largest social media in the world, made a huge step of entering the dark web through anonymous network, Tor. The working mechanism of tor was proved to make the users' untraceable and this is the company's way of providing further accessibility and security for their users.

With Facebook entering a new venture with Tor a new vision has come to light with regards to anonymity and social network. In the past, it may seem impossible but as technology advancements are continuing then the possibilities become higher. Other social networking sites may also want to join Facebook into launching a new environment for their active users.

Some may conclude that because of Facebook's encouragement to use Tor, it can become a medium in doing wrongful acts. They may fail to realize that it is impossible because Facebook is still a public site and as a leading social networking media then it is their job to prevent such things from happening. The location wouldn't be trackable however the communications happening can still be visible.

With the discussed problems such as internet censorship, surveillance, and other threats like black market and hackers, it was learned that Tor was both beneficial and harmful. Activists all around the globe use Tor browsers to fully exercise their freedom of speech without being monitored and manipulated by the government. This has a huge impact in a nation considering how powerful exchange of ideas is in this modern time.

On the other hand, NSA and FBI are some of the constant big brothers of the world. It was stated that the anonymity tool still has features yet to be improved for these agencies are continuously advancing their technologies to penetrate the system, making the Tor developers to further step up their capabilities in their software.

The study was only focused on social networking sites being freely used in the Tor network and its aftermath. Further studies can include discussions about Facebook's illegal activities since the venture with Tor. The relationship between the two can lead to strengthening or weakening the study's findings. A different approach can be from Tor users and online crime rate in social networking sites may also be pursued for further investigation about the implication of the program.

V. References

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