

Cyber Security

Title: Mitigating the Pervasive Threat of Spam Calls in the Modern Digital Landscape

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Abstract

In the contemporary smart world, a primary concern lies in the rampant occurrence of hacking and data theft, leading to detrimental consequences such as financial loss and compromised confidentiality. A prevalent method employed by malicious entities involves the dissemination of spam emails housing viruses capable of data destruction or facilitating other nefarious activities. Similarly, spam calls are utilized to extract sensitive information or track mobile devices. Hence, this research paper aims to address the pressing issue of reducing the proliferation of spam calls.

Keywords

Spam calls
Call Blocker applications
Security
Caller ID

INTRODUCTION

The advent of digitalization has revolutionized the way we interact with technology, fostering unprecedented connectivity and convenience. However, this paradigm shift has also ushered in a plethora of cybersecurity challenges, chief among them being the incessant onslaught of hacking attempts and data breaches. Of particular concern is the utilization of spam emails and calls as conduits for malicious activities, posing significant threats to individuals and organizations alike. While considerable attention has been devoted to combating email-based spam, the proliferation of spam calls remains a formidable obstacle in safeguarding digital ecosystems.

Theory

Certain call-blocking applications employ both blacklisting and whitelisting functionalities. The blacklist comprises contacts or recent calls flagged by the user as potentially harmful to their data, while the whitelist consists of trusted contacts deemed safe for communication. Some applications automatically block calls from contacts listed in the user's blacklist, such as Nomorobo and Hiya: Spam Phone Call Blocker. Conversely, other apps, like Truecaller, promptly alert users upon receiving a call marked as spam or hazardous, without automatically blocking it. Truecaller's

nature is more dynamic allowing the users to see if the person calling is trusted one or not.

This research paper will delve deeper into Truecaller's nature, its effectiveness and shortcomings.

What is Caller ID?

When a person calls you, this ID will be displayed on your screen to identify the caller. Caller IDs are essential as they can show if the person you know is calling or not. The identification of the name associated with a particular number, if not already provided by users, relies on sources such as user profiles and public collaborations. This is done with the consent of the user thus following the Data Protection Regulations. Moreover, individuals who sign up on the Truecaller application have the option to customize their Caller ID appearance by entering their preferred names. Based on big data collected by the company regarding the call receivers indicating the person to be as safe or spam, the app can notify the receiver if the person calling is likely for spam (shown in red) or is safe. Currently, when a Truecaller user calls someone, notification will be securely sent via data/ wifi before the call gets connected or even rings. This is possible because data/wifi is faster than a regular cellular network making it faster than the actual call.

Experimentation

Firstly, over a period of time of 12 hours, the number of spam calls received and the time at which they were received was recorded. This was done without using any call blocking application. Then over the next 12 period of the number of spam calls received and the time at which they were received was recorded but this time using a call blocking app that uses blacklist as it automatically blocks and only allow the calls which were not received before. In this case Truecaller was used. The 12-hour period was measured from 9 AM till 9 PM to avoid any biasness in the data and to see the effectiveness of Truecaller. The 12-hour period was further divided into 4 time period of 3 hours each:

- 9 AM to 12 PM
- 12 PM to 3 PM
- 3 PM to 6 PM
- 6 PM to 9 PM

Data Collected

Number of Spam Calls received		
Time Period	With out using Truecaller	Using Truecaller
9 AM to 12 PM	3	1
12 PM to 3 PM	3	2
3 PM to 6 PM	3	1
6 PM to 9 PM	1	0
Total	10	4

Table 1: Number of Spam Calls received

Discussion

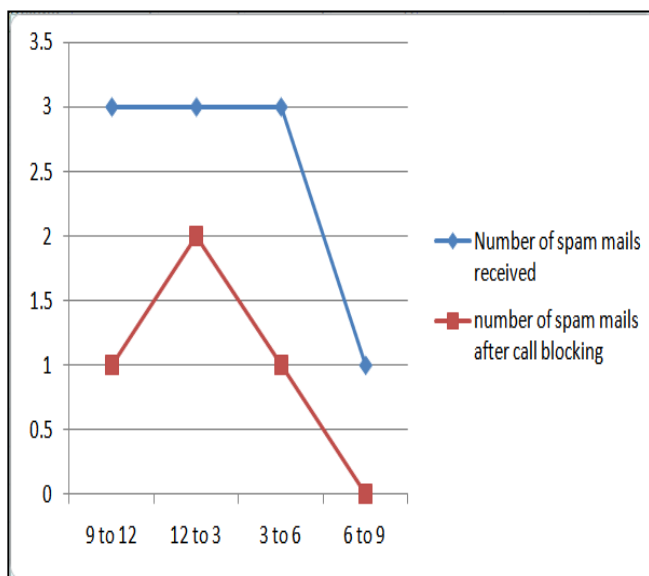


Figure 1: Comparison between number of spam calls with and without Truecaller

The total numbers of spam call received were 10 when Truecaller was not used. But after using call blocker the numbers of spam calls received decreased to 4. There was 60% reduction in the spam calls received. Thus, it shows how effective they are. Similar results are written in the news article written by Priyanshu Meena and is published in Timesbull.com.¹ Also, according to Aura.com, Truecaller is listed second in the category of '10 Best Spam Call Blockers in 2023'². They did not become zero because hackers daily use multiple numbers or use the numbers, they have hacked to call but the app recognizes it as new number. Despite this, the app is effective at recognizing spam calls and trying to notify the users about them to ensure security. Although, there is not 100% reduction, as the technology is evolving rapidly, various developments are taking place in the field of cyber security to improve the security.

The graph also reveals some underlying trends: the frequency of spam calls in both the cases were high during 12 PM to 3 PM, which are the working hours of most people (except for those have flexible working and night shifts). Thus, this is the most effective time for spam calls to achieve their goals. 9 AM to 12 PM is the time when the people are getting ready, going to office or doing things and there is the chance that these spam calls will be ignored and thus the frequency of spam calls is less during this time. The least chances of getting a spam call are during 6 PM to 9 PM.

Same is applicable for emails, but the user does not have to externally install any additional application to avoid spams as Google's email system blocks spam mails using filters in Gmail.

Limitations of The Research

Although the research is based on primary data collected, there are some factors that need to be taken into account:

1. The data was collected only once and thus cannot be relied upon completely. One potential way employed to overcome this limitation is referring and drawing inferences from other well-known and authentic sources like Timesbull and Aura.
- Few Ways To Reduce Spam Calls And Emails
1. Be careful about whom emails and number are shared with
 2. Check privacy policies
 3. Report spam mails and calls
 4. Don't click on the links in spam mails and don't share data over call, especially related to bank account and money
 5. Don't pick up calls from unknown number if not sure³

CONCLUSION

It is efficient to use Truecaller (it can be inferred that other call blocker also) as it will efficiently tell you before you pick the call by showing that it could be spam call or in some other way and call blocker will block the calls and moving the number into blacklist. Also working hours is the time when people receive the most spam calls. (DISCLAIMER: this research is not trying to promote or demote any software application and should only be regarded as a piece of research)

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