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Systems and Methods for SPIT Detection in VoIP: Survey and Future Directions

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Abstract

In recent years, VoIP (Voice over IP) telephony has shown a tremendous increase in the number of subscribers due to today's affordable telephony rates and flexible use of Internet technology for voice communication. At the same time, a proportional increase was exhibited in VoIP spamming and SPam over Internet Telephony (SPIT), which are forms of abuse and frauds that can have severe consequences and financial losses for both the service providers and subscribers. This paper surveys, reviews, and discusses the state-of-the-art detection and mitigation techniques and systems for VoIP spamming and SPIT. The paper highlights reasons and motivation behind such abuse and fraud, and it discusses the primary challenges in devising an effective and efficient anti-SPIT detection solutions. Moreover, the paper outlines shortcomings and limitations of existing solutions, and it identifies future research directions to aid in further improving and enhancing effectively and efficiently the detection and mitigation of SPIT and spamming.

KEYWORDS: Voice over IP (VoIP), VoIP Spam, SPam over Internet Telephony (SPIT), SPIT Detection

1. Introduction

Voice over IP (VoIP) is an Internet Protocol (IP)-based voice communication system that is increasingly used by a large number of people along with the traditional public switched telephone network (PSTN) for business and personal communications. In recent years, VoIP has seen an enormous growth in the number of subscribers due to its attractive affordability calling rates globally. Moreover, VoIP provides affordable value services and flexibility of using IP networks for the voice communication. According to Cisco [1], VoIP market is expected to reach more than 1200 million subscribers worldwide by 2018 with expected revenue of more than $77 billion [2]. Figure 1 depicts the growth of residential VoIP subscribers from 2011 to 2016. The number of business subscribers is also increasing at a rate of 7.58%, and is expected to reach 244 million business subscribers by 2018 [1]. The affordable calling rates of VoIP, its easy integration with the IP networks, and value added services have also created a lucrative opportunity for spammers and telemarketers to initiate unwanted, bulk un-solicited calls via VoIP. In VoIP terminology, these calls are referred as SPam over Internet Telephony (SPIT)

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