Final Report for the Project Titled:

SIM BOXING PROBLEM

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ABSTRACT

Telecommunication fraud is recently considered as a significant problem that costs mobile network service providers billions of dollars annually. Although adventing new technologies expected to reduce fraud, it has provided fraudsters new techniques to commit fraud. SIM box fraud is considered one of developed fraud that has emerged with the use of VoIP technologies. Fraudsters have used this technology to bypass their calls the international/national gateway switch and standard termination fees. Efficient fraud detection systems as well as data analysis systems can be used to enable telecom operators to stop fraud and save a lot of money. In this work, SIM Boxing problem is studied and identifying SIM box fraud subscriber scenario derived from the attributes of the Call Detail Records (CDRs) is proposed. More precisely, examining the attributes of the CDRs of mobile subscribers in order to identify the data set of normal and fraudulent behaviour has been done in this work. We applied this study on AL-MADAR Company CDRs and we found that only 2% to 9% of behaviours (depending on data length) might show important tendency for fraudulent use and need to be monitored.

Keywords – SIM Box, Fraud Management, Fraud Detection, Call Detail Records (CDR).

1. INTRODUCTION

1.1. Telecom Fraud

With the rapid development of communication technologies, fraud has become a serious global problem and a significant source of revenue losses for telecom companies worldwide. With the expected continuing growth in revenue it is expected that fraud will increase proportionally and serious action against fraud phenomenon is needed to detect and prevent such crime by inventing robust techniques and imposing prosecutions against fraudsters. Although fraud and bad debt both have to do with network users, not paying for the used services, there is difference between bad dept and fraud. Bad dept concerns subscribers with occasional difficulties in paying for their invoices. Such difficulties in paying the used services happens rarely and occasionally without any intention to do that. In such cases, subscribers will probably be suspended and denied to open a new subscription in the future till paying for their invoices. In contrast, fraud concerns subscribers with no intention of paying for using the operator's network; i.e. the theft of service and misuse of voice of telecom providers is considered as fraud. The fraudster's intention could be to avoid the service charges completely or even reduce the charges of the used service. The intention could also be deeper and the aim might be to gain profit by misusing the network of the provider [1]. Therefore, in telecom fraud, a fraudster never has the intention to pay and most likely to repeat such a committed crime in future. In other words, if a subscription is disconnected or blocked by the service provider, the fraudster will probably find other ways to obtain a new subscription and continue the fraudulent activities. Even though telecommunication industry suffers highly significant losses due to fraud, there is no comprehensive published research on this area. Security and lack of publicly available data to perform experiments on are the mainly reasons behind that. Obviously, the data to be used for the experiments contains confidential information of customers and usually law and enforcement authorities prohibit exposing such private information. Moreover, any studies or solutions related to fraud detection methods published publicly will be utilized by fraudsters to evade from detection [2, 3].

1.2. Telecom Fraud Classification

In general, there are many different types of telecom fraud. Some different scenarios are the more pervasive types of fraud harming telecom providers today will be highlighted shortly in this section. In the beginning, the subscription fraud was the only fraud committed which is a concept involving different illegal ways to obtain subscription under false identities. It is