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Methodologies to mitigate wangiri fraud

Technical Report ITU-T TR.MMWF

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Summary

This Technical Report aims to define wangiri fraud in telecommunications and to provide the most effective methodologies to mitigate this type of fraud.

Keywords

Fraud, premium rated numbers, wangiri.

Note

This is an informative ITU-T publication. Mandatory provisions, such as those found in ITU-T Recommendations, are outside the scope of this publication. This publication should only be referenced bibliographically in ITU-T Recommendations.

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1 Scope

This Technical Report provides a definition of wangiri fraud and some methodologies to detect and mitigate this type of telecommunication fraud. Moreover, this technical report will describe the possible role of Member States, Recognized Operating Agencies (ROAs), service providers, manufactures and regulators to fight against wangiri fraud globally.

2 Definitions

2.1 Terms defined elsewhere

This Technical Report uses the following terms defined elsewhere:

2.1.1 country [b-ITU-T E.101]: A specific country, a group of countries in an integrated numbering plan or a specific geographical area.

2.1.2 operator [b-ITU-T E.101]: An operating agency providing public telecommunication networks or public telecommunication services.

2.1.3 national destination code (NDC) [b-ITU-T E.101]: A nationally optional code field, within the international public telecommunication numbering plan (hereafter referred to as the "international E.164 numbering plan"), which – combined with the subscriber's number (SN) – will constitute the national (significant) number of the international E.164-number for geographic areas.

2.1.4 calling party number [b-ITU-T E.157]: The ITU-T E.164 number of the originator of the call or a special allocated number.

2.1.5 international calling party number delivery [b-ITU-T E.157]: Calling party number delivery across boundaries of countries.

2.1.6 special allocated number [b-ITU-T E.157]: A number from a series that the numbering plan administrator (NPA)/national regulatory authority (NRA) has allocated for the specific purpose of enabling operators/providers to show that they are responsible for a call when the original calling party number (CPN) cannot be transmitted.

2.2 Terms defined in this Technical Report

This Technical Report defines the following terms:

2.2.1 wangiri: Type of telecom fraud using short or one-ring calls ("one ring and drop") to cheat subscribers by prompting them to call back the number, which is a premium rate number (PRN), resulting in the victim incurring very expensive charges and rates.

2.2.2 premium rate numbers: Special numbers dedicated to a certain service with a charged rate higher than usual rate.

3 Abbreviations and acronyms

This Technical Report uses the following abbreviations and acronyms

CDR Call Detail Record

CLI Calling Line Identity

CPN Calling Party Number

CPND	Calling Party Number Delivery
IVR	Interactive Voice Response
NDC	National Destination Code
PLMN	Public Land Mobile Network
PRN	Premium Rate Number
PRS	Premium Rate Service
PSTN	Public Switched Telephone Network
ROA	Recognized Operating Agency
SIM	Subscriber Identity Module

4 Introduction

The rapid growth of the telecommunication landscape leads to a rapid rise in fraud using telecom infrastructure. Wangiri is a common fraud activity targeting subscribers as well as telecom operators, in which fraudsters make calls but hang up after the first ring to entice or prompt victims to call back. Hence, the name wangiri, which is a Japanese word that means "one (ring) and cut." When victims call back, they do not realize that it is a premium rate number, and they are hit with very high charges without their previous knowledge. This problem is growing rapidly in different countries, but in general, these premium rate numbers seem to be from developing countries.

A large volume of calls is delivered to the target networks with no apparent intention of establishing a conversational call set-up (zero-duration calls). Also, often no call detail records (CDRs) are generated in many management and signalling systems because the calls are not answered (they are considered as missed calls only).

5 Wangiri definition

'**Wangiri**' is a Japanese word, which literally translates as 'one ring and drop'. And a **wangiri** call does just that. Calls are usually cut off just as the phone rings, leaving a missed call message from an international, or unusual number. When unsuspecting victims return the call, they are routed to an expensive premium-rate service that earns the scammer a fortune in commissions.

In wangiri fraud the scammers generate single-beep phone calls to many phone users using an auto-dialler. When the user calls back out of curiosity on receiving a missed call, the scammers try to keep the victims busy on the line for as long as possible. The calls are directed to either a real person or an interactive voice response (IVR) system to extract as much money as possible since the call is routed to a premium-rate number.

6 Background and description of the fraud

Telecom operators have been facing this type of fraud since 2009, when early cases were found in Japan. Since then, this type of fraud has been growing exponentially year by year all over the world. In wangiri, a fraudster gives a missed call to several victims' phone numbers from different countries from an international or unusual number. To the subscriber, the calling party number /calling line identity (CPN/CLI) is modified in such a way that it looks like a genuine call, and when the victim calls back, it turns out to be a premium rate number (PRN) owned by a fraudster, for which the victim is charged heavily for the calls. The fraudster intends to keep the victim on hold to increase the billed amount. The premium rate service provider pays the fraudster a certain share of the call revenue for each minute of call received by the premium rate number.

As declared in multiple fraud loss survey reports, wangiri is one of the top 5 fraud methods used by fraudsters to carry out fraudulent activities.

7 Problems of wangiri

7.1 Impact of wangiri fraud on telecom operators and customers

Some telecom operators suffer from both direct and indirect losses due to wangiri fraud. Wangiri impacts customers adversely, resulting in customer churn due to high customer dissatisfaction from bill shocks and a bad customer experience. It also has a negative impact on the operator brand image, as subscribers would complain about the high call rates charged without them being aware. There is also an impact on the cost due to the increase in customer management.

Why can wangiri not be eliminated completely?

7.2 Reasons due to which wangiri cannot be eliminated but can be managed

– Some operators, whose users are the fraudsters, do not take action on wangiri fraud, as it relates to large volumes of inbound calls and thereby generates significant revenues.
– Limited implementation of ITU-T E.157 calling party number delivery (CPND) requirements through the whole call route path.
– Lack of strict regulation on the CPND. The lack of visibility on the carrier who is originating the call is another reason why wangiri cannot be eliminated.
– Most wangiri frauds are conducted using international numbers. Telecom operators cannot effectively track them due to the complications related to international calls.
– Wangiri fraudsters continuously change their fraudulent behaviour.
– The numbering range for the premium rate number/premium rate service (PRN/PRS) looks similar to ordinary phone numbers.
– Limited/light possibilities for CDR in/out monitoring and management.

The end carrier who terminates a fraudulent missed call is not aware of the fraudster's details or whether the country from which the call originated is a high-risk destination or not. Enhanced awareness at the carrier level can significantly decrease many wangiri cases.

8 Proposed methodologies to mitigate wangiri fraud

Detect wangiri fraud attacks as quickly as possible and minimize the fraud window during which most of the losses occur. Some methodologies to reduce wangiri risk are described in clauses 8.1 to 8.17. All Member States, recognized operating agencies (ROAs), service providers, manufactures and regulators are invited to consider the measures described in clauses 8.1 to 8.17 to mitigate the wangiri fraud.

8.1 Customer experience management

As the customer is the main target of any business, telecom operators need to manage their customer complaints efficiently, which will reduce customer churn and loss of revenue. All employees of telecom operators could be informed about wangiri and how to manage complaints related to this fraud.

8.2 Subscriber awareness

A pro-active approach minimizing wangiri fraud would involve making the subscribers aware of the risk. Customers may be alerted through information, education and communication (IEC) campaigns by the operators about the risk involved in calling back missed calls received from international numbers. There are several free apps that have active community platforms where users continuously

report spam numbers. These apps, which can be used to quickly check suspicious numbers, would tell the customer if the number is part of any ongoing scams or not, and it would also help them to block the spam numbers used for wangiri calls.

8.3 Using artificial intelligence and machine learning

Telecom operators might have an artificial intelligence and machine learning system to analyse call data, identify anomalies associated with wangiri fraud and alert customers via different means when missed calls are received from suspicious numbers.

8.4 Number blocking

Implement call monitoring and analysis to detect patterns indicative of wangiri fraud, such as a high volume of short-duration calls. Regulators in different countries might allow telecom operators to block all numbers that were repeated in the wangiri fraud.

8.5 Information, education and communication (IEC) campaigns

Regulator IEC campaigns are essential for the dissemination of information about the charging plan of premium rate numbers because a large segment of customers is not aware of the high rates of such premium rate numbers.

8.6 Sharing of black lists

Regulators in different countries might set up a mechanism to share the most frequent numbers committing wangiri fraud.

8.7 The proper management of national numbering plans

Regulators might prepare a mechanism to ensure the proper use of national destination codes (NDCs) with operators in order to avoid different types of fraud, including wangiri, call masking and spoofing.

8.8 The application of WTSA Res. 91

[b-WTSA Res.91] encourages all Member States, "pursuant to the relevant ITU-T Recommendations, to present information on their national numbering plans and amendments thereto in a timely manner, and as per the format provided for in [b-ITU-T E.129], so as to ensure that the electronic repository remains in order and up to date."

8.9 PRN recognition

Regulators should assign a short code for PRNs, different from an ordinary operator's range.

8.10 Publishing of premium rate numbers

Regulators may mandate telecom operators to publish the premium rate numbers, accessible from their network along with charging rates, on their website or in a common national or international database.

8.11 Publishing of PRN numbering ranges

Regulators may publish PRNs in official national and international information resources.

8.12 Fixing ceiling rates

To protect the interests of end subscribers and telecom operators, regulators may evaluate the fixing of some ceiling rates which can be applied for providing premium rate services using public switched telephone networks (PSTNs) and public land mobile networks (PLMNs).

8.13 Strict implementation of Recommendation ITU-T E.157 and other relevant ITU-T Recommendations

This methodology helps to mitigate telecommunication fraud in general, not only wangiri fraud.

8.14 Agreements between networks

Establishment of agreements that foresee monitoring high traffic peaks with unanswered calls and tracking calls from the originating network to the destination.

8.15 Removal of international services as the default service for a subscriber

International service calling facilities should not be activated on prepaid subscriber identity module (SIM) cards without the explicit approval of the consumer.

8.16 Regulatory cooperation

Work with regulatory authorities and other telecom providers to share information about known wangiri numbers and collaborate on fraud prevention efforts.

8.17 Geolocation filtering

Implement geolocation filtering to block incoming calls from specific regions known to be sources of wangiri fraud.

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