SURVEY PAPER ON PHIDFIVE-PHISHING DETECTION MODEL USING FIVE LEVEL APPROACHES

Ramya.T[1], Sangeetha.S[2], Soundaraya.R[3] , Dr.EmilinShyni.C[4]
[1,2,3]Final year CSE, KCG College of Technology, Chennai.
[4]Professor, Department of Computer Science and Engineering,
KCG College of Technology, Chennai.

ABSTRACT

Phishing is an example of social engineering techniques used to deceive users and exploits weakness in current web security. Phishing is established that single filter could be insufficient to detect different categories of phishing attempts. So the PhiDFive model is used to detect phishing using five levels of straining. First level of straining is blacklist, second level is URL Verification straining, the third level is Lexical signature straining, the fourth level is Text matching scoring and the fifth level is Accessibility score strainer. PhiDfive model features are to check the websites in various dimensions. Phishing is typically carried out using instant messages and often direct user to give details at a fake website. This paper presents a detailed view about various phishing attacks and techniques to overcome fake websites.

KEYWORDS: accessibility, blacklist, deceive, phishing, web security.

INTRODUCTION

Phishing remains a basic security issues in the cyberspace. Many web application threats prevail in the Internet domain that try to steal the user's sensitive information or alter the web server's database, or destroy the credibility of the particular web application. Phishing is a technique of tricking people into giving sensitive information like usernames and passwords, credit card details, sensitive bank information, etc., by way of email spoofing, instant messaging, or using fake web sites whose look and feel gives the appearance of a legitimate website. Each level in PhiDfive model works like a pipeline where one level passes and then the following level gets the chance to check.

BLACKLIST STRAINER:

This level deals with the blacklist verification which handles the exact matching of the current URL with blacklist URL. Initially, the model receives the URL as input from the users and verifies the URL in the blacklist.

URL FEATURES STRAINER:

URL features strainer has five phases. They are IP-based URL, Age of Domain, Length of URL, Number of dots and Suspicious URL. In five phase of above checking, calculating a threshold value and finding whether the URL is legitimate or illegitimate.

LEXICAL SIGNATURE STRAINER:

The Lexical signature layer has three phases. They are Text mining, constructing the signature and feeding into the search engine. Lexical signature is derived using the model and feed on the search engine. If any link is not returning by the search engine, then the model stops check and alarm the client with respect to phishing website. If the search engine returns links, at that point the model forwards the links to the next level.

TEXT MATCHING STRAINER:

This model measures the similitude level of the given URL with the URLs received from search engine using two Texts matching algorithms: Longest Common Subsequence (LCS) which measures the similarity of two strings. Hamming Distance measures the edit distance between two or more strings. It measures the minimum number of substitutions required to change one string into the other, or the minimum number of errors that could have transformed one string into the other. This model forwards the URL to the next level for further confirmation.

ACCESSIBILITY SCORE STRAINER:

This is the last level of the model. The model compares the score with the threshold value. If the score is above the threshold value, at that point the model educates to the clients regarding phishing site. The accessibility feature proposed by the PhiDFfive model is a novel effect to utilize the Accessibility of the Web Pages in finding the similarity.

If the URL passes through all the strainers, then the model upgrades the whitelist with an legitimate URL, otherwise upgrades the black list with the phishing URL. The working model will be launched as a website.

RELATED WORK

Several studies have addressed the issue of phishing in recent years. Each of these studies approaches the problem of phishing with a unique method. Subsequently, Key Factor of each technique is explored in the remaining part of this section.

Detecting the phishing attacks follows a two pronged approach: detecting and filtering phishing websites and email. The author **[1]** has proposed four methods like creating a phishing dataset, implementing features, fresh-phish dataset and classifiers. Here implementing features has five categories like URL based, DNS based, external statistics, HTML based and java script based.

Detection of malicious WebPages based on hybrid analysis approach has been proposed for detecting malicious web pages**[6]**. In static analysis the process of classification is extraction of features, selection of features, and classifier. In extraction of features, we analysis the characteristics of malicious web pages. The categories of those web pages are URL, HTML document, java script in source code. In selection of features, we have correlated-based Feature Selection (CFS) which is used to select the most representative subset of features. Dynamic analysis is the second stage of this process.

In Proxy Detector signature-based and characteristic based methods are two main stepping stones detection mechanism. The proxy detector system has proxy detector system overview, proxy detector system details and website classification**[4]**. The proxy detector system overview has broken into various steps. The component of proxy detector system details are URL/web content store, feature extractor, and DOM based features. In websites classification, we have algorithm like logistic regression, native Bayes, Support Vector Machines with linear kernel and RBF (Radial Based Function) kernel.

The Author (Abbasi et al)**[9]** classified three types of fake websites. They are spoof websites, concocted websites, and web spam. Abbasi et al. developed a fake website detection system that employed classification methods grounded in statistical learning theory (SLT). It could evaluate multiple web pages from a potential site for improved performance and had a feature set that utilizes over 5,000 features from 5 information types: Body text, HTML design, Images, Linkage, and URLs. Another Author Zhang et al. developed a novel, content-based approach, called CANTINA, to detect phishing websites. CANTINA uses the TF-IDF information retrieval algorithm. Their heuristics includes age of domain, known image, suspicious URL, suspicious links, dots in URL, forms and IP address. Phishing websites detection in this process are web crawler development, analysis using rapid miner, and calculating weights of heuristics.

Various researches and methods have been done to study the details of web spoofing attack. Prevention methods of website spoofing are survived and classified into various approaches: content-based, heuristic-based and blacklist-based approaches. In content-based approach, the research is conducted by CANTINA**[10]**. Goldphish is another content based solution. This solution uses google as search engine. GoldPhish algorithm depends on capturing an image for the current website in the user’s web browser. Heuristics based approach uses HTML or URL signature identify the spoofed webpages. There are several researches conducted based on this approach. SpoofGuard is one of the solutions that uses heuristics approach. In blacklist based approach is retrieving the URLs from phishing pages in order to maintain and create the blacklist. The URLs can be retrieved from the users phishing emails, spam, or from the organization that serve the anti-phishing such as Anti-Phishing Working Group (APWG) and Phish Tank.

Author WeiweiZhuang**[2]** has proposed anti-phishing strategy model for phishing website detection and categorization like model description, feature extraction and selection, base feature classifiers, ensemble classification method, hierarchical clustering algorithm and Human-In-The-Loop. In Model Description, the main components are feature extractor, classifier training module, ensemble classification module and cluster training module. In ensemble classification method the author proposed new method called CBE (Correlation Base Ensemble). In hierarchical clustering algorithm has been categorized into agglomerative algorithm and divisive algorithm.

A hybrid model approach can be proposed a target to solve phishing website problem. Methods of this hybrid model are dataset, data splitting criteria, data mining classification techniques, ensemble methods, hybrid methods and performance evaluation. In dataset, the data are used from UCI**[5]**. Data mining classification includes random forest, decision tree, naïve bayes, fuzzy unordered rule and Bayesian net algorithm. In performance evaluation, there are various components. They are evaluation of a model, recall, precision, F-measure, error rate, classification accuracy and conclusion matrix with actual and predicted.

Machine learning techniques have been powerful data analysis tool in many application domain such as medical diagnosis, market basket analysis and weather forecasting. The author (NedaAbdelhamid)**[8]** analyze study related to phishing in research literature based on machines learning techniques. Websites can have specific features like URL length, prefix-suffix, sub-domain. Author has manually categorized features into six criteria and then loaded them into environment for a WEKA. Enhanced Dynamic Rule Induction (EDRI), is one of the first covering algorithm that has been applied as anti-phishing tool.

Naïve Bayes classification algorithm is usually applied to solve selected present or absence of words in documents. Traditional spam filtering techniques is support vector machine (SVM), which is implemented to classify the email to set spam emails apart **[3]**. Detecting algorithm are semantic web database, category database, detecting phishing emails and give advice according to the email categories. In category database we discuss about even pair generation process, classify email using fuzzy logic control which has fuzzification and defuzzification.

Author (Jianyi Zhang)**[7]**has proposed different features extraction method for phishing URL detection. Methodology of this paper are URL features, knowledge transfer and classification model. In URL features, URLs are built in a common way to masquerade has trustworthy entity. URLs are collected from normal HTTP steam. The important features of URL are hosted features and lexical features. In knowledge transfer has been widely used in learning engineering areas like data mining and machine learning. Implementation of URL based phishing detection is multiple data source, feature extraction, phishing detection, training process and model transfer.

CONCLUSION:

This paper provides various methods to detect phishing websites and emails based on the features of URL (Uniform Resource Locator). But Phishing is a constant and complex issue, and it is persistently changing its ways to assault victims. Single approach is lacking to identify all classes of phishing attempts, as it is completely utilizing different assortments, and their assaulting courses as well as distinctive. Hence, a Multi-filter approach incorporated with five layers: Auto upgrade white list layer, URL features layer, Lexical signature layer, and String matching layer and Accessibility score comparison layer. So that persons with visual impairments can access it without any barrier.

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