

SOFTWARE PUZZLE: A COUNTERMEASURE TO RESOURCE-INFLATED DENIAL OF SERVICE ATTACK

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ABSTRACT:

The Software Puzzle: A Countermeasure to Resource-Inflated Denial-of-Service Attacks system is based on networking & cyber Security domain. Cyber security is the body of technologies, processes and practices designed to protect networks, computers, programs and data from attack, damage or unauthorized access. In a computing context, the term security implies cyber security. Ensuring cyber security requires coordinated efforts throughout an information system. An element of cyber security includes network security and Information security. Denial-of-Service Attacks (Dos) attacks have become a major threat to current computer networks. Denial-of-Service Attacks (Dos) attacks on the internet aim to prevent the authorized user or clients from accessing a service and are considered a serious threat to the availability and reliability of the internet services. Such an attack is easy because the attacker often pays very little for requesting a service, Most of the time only the cost of sending a network packet. In practice the most part of connections of subjects of wide area networks uses the virtual connections as this method is information. Therefore, the interaction without establishing a virtual channel is one of the possible reason for the success of remote attacks such as DoS/DDoS. Software puzzle scheme is proposed for defeating GPU-inflated DoS attack. It adopts software protection technologies to ensure challenge data confidentiality and code security for an appropriate time period, e.g., 1-2 seconds. Hence, it has different security requirement from the conventional cipher which demands long-term confidentiality. This DoS/DDoS attack blocks the authorized clients from accessing the services so to overcome or to solve the problem software puzzles are created. These software puzzles are not stored or previously created, they are created at runtime whenever the client requests a particular service the software puzzle is created and the client is supposed to solve the puzzle and give the solution within the required time period. Once the puzzle is solved correctly by the client within the specified time, the client will be provided the service even if the attacker tries to block the service of the client he cannot block it. The software puzzle scheme is proposed for DoS attack. It adopts software protection technologies to ensure challenge data confidentiality and code security for an appropriate time period. It can be used in many organizations, online banking system.

1. INTRODUCTION

Denial-of-service (DoS) and distributed Denial of Service (D-DoS) are the major threat to cyber-security. Software

puzzle scheme is proposed for defeating DOS attack. It adopts software protection technologies to ensure challenge data confidentiality and code security for an appropriate time period, e.g. 1-2 seconds. Hence it has different security requirement for the conventional cipher which demands long-term confidentiality. The DOS/D-DOS attack blocks the authorized client from accessing the services so to overcome or to solve the problem software puzzle are created. These software puzzles are not stored or previously created, they are created at run time. whenever the client requests a particular service the software puzzle is created and client is supposed to solve the puzzle and give the solution within the required time period. Once the puzzle is solved correctly by the client within the specified time, the client will be provided a service even if the attacker tries to block the service of the client he cannot block it. The software puzzle scheme is proposed for DOS attack.

2. EASE OF USE

2.1 Background

A DOS attack which make a computers or resources not available to its predetermined users, such as to temporarily or indefinitely discontinue or suspend services of a host connected to the Internet. DOS is typically proficient by overflow the targeted machine or resource with no of requests in order to overload systems and prevent some or all legitimate requests from being fulfilled, to overcome such type attack we use CPP Algorithm.

In our system Client Puzzle Protocol (CPP) is a computer algorithm is use the goal of algorithm is to solve the graphical puzzle with in time limitation. After solving the puzzle the client should download the file which is requested.

2.2 Motivation

In previous system attacker attack using D-Dos attack on software puzzle system very easily because there is no time limit and puzzle is already created and stored into database. The existing client puzzle schemes, which publish their puzzle algorithms in advance, a puzzle algorithm in the present software puzzle scheme is randomly generated only after a client request is received at the server side and the algorithm is generated such that: an attacker is unable to prepare an implementation to solve the puzzle in advance

3. SYSTEM ARCHITECTURE:

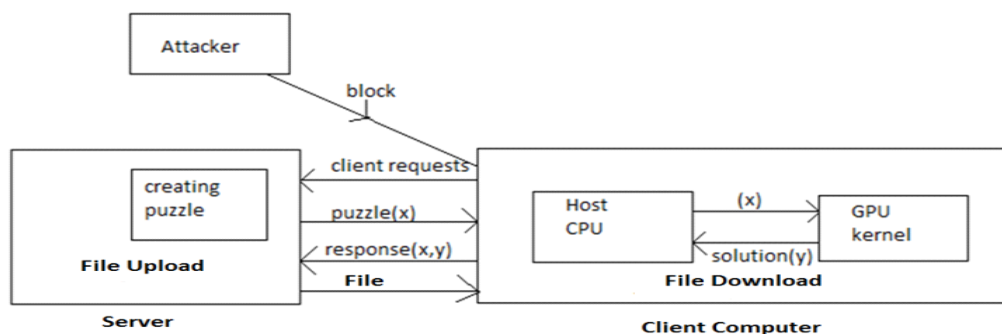


Figure3.1. System Architecture

In fig 3.1(System Architecture) Software puzzle scheme is proposed for defeating GPU-inflated DoS attack. It adopts software protection technologies to ensure challenge data confidentiality and code security for an appropriate time period, e.g., 1-2 seconds. Hence, it has different security requirement from the conventional cipher which demands long-term confidentiality. This DoS/DDoS attack blocks the authorized clients from accessing the services so to overcome or to solve the problem software puzzles are created. These software puzzles are not stored or previously created, they are created at runtime whenever the client requests a particular service the software puzzle is created and the client is supposed to solve the puzzle and give the solution within the required time period. Once the puzzle is solved correctly by the client within the specified time, the client will be provided the service even if the attacker tries to block the service of the client he cannot block it. The software puzzle scheme is proposed for DoS attack. It adopts software protection technologies to ensure challenge data confidentiality and code security for an appropriate time period. It can be used in many organizations, online banking system.

In our project we have identified following objects:-

The user will perform following functions:

1. Client:

- Register ()

In this we enter the Client information ex. Name, Mac Address, IP Address

- Login ()

In login page enter User Name, Password for using software puzzle system.

-Search Query ()

The client request to the Server for Service though search query.

-solve puzzle ()

Client solve the puzzle in given time and get service from Server.

2. Puzzle:

-Create ()

The puzzle create at Sever side when client request for service and send it to the client.

-Processing ()

The puzzle should forwarded to client and

-Puzzle Answer ()

Client solve the puzzle and give answer to server.

3. Server

-Provide services()

Server check the answer of puzzle if user is authorized then provide service to the user.

-Block IP ()

If client is unauthorized then server will block that user and block the IP.

4. Data Server

-Store data()

Server store IP address, MAC address, User Information

-Send data()

Server sends puzzle to client when client request for service.

-Receive data()

Client get access to service if client solved puzzle in particular time period.

4. PROPOSED DESIGN

This DoS/DDoS attack blocks the authorized clients from accessing the services so to overcome or to solve the problem software puzzles are created. These software puzzles are not stored or previously created, they are created at runtime whenever the client requests a particular service the software puzzle is created and the client is supposed to solve the puzzle and give the solution within the required time period. Once the puzzle is solved correctly by the client within the specified time, the client will be provided the service even if the attacker tries to block the service

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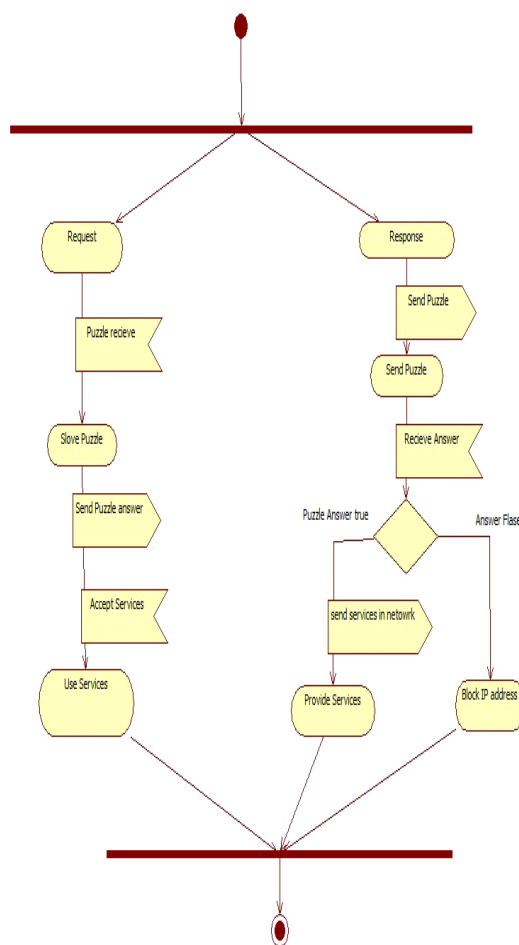


Figure 4.1. Control flow of proposed system

5. IMPLEMENTATION DETAILS

Module 1:

Client module: In this module client request to server. Client Solve puzzle which option is present in this module. The purpose of this module is to provide the user interface and view functions for the system. This is the software with which the user directly interacts with server. It communicates with the server to retrieve and modify persistent data when necessary. This module is created to provide the user interface to the system.

Module 2:

Puzzle module: A Puzzle module allows you to insert a puzzle game into a presentation. It is enough to upload an image which is later automatically divided into separate items and put in rows and columns. The required number of rows and columns can be defined in the Properties menu. Puzzle supports the following graphic formats: JPG, PNG, BMP. Vector formats are not supported.

Module 3:

Server module: The purpose of this module is to provide a centralized place where information for the system can be stored, manipulated, and accessed. This module is created to centralize and encapsulate all data storage and retrieval duties on the system. This includes user profiles, success stories, banner ads, pictures, and messages. It also provides some services, such as authentication, network communication and search.

6. ALGORITHM

Algorithm for puzzle:

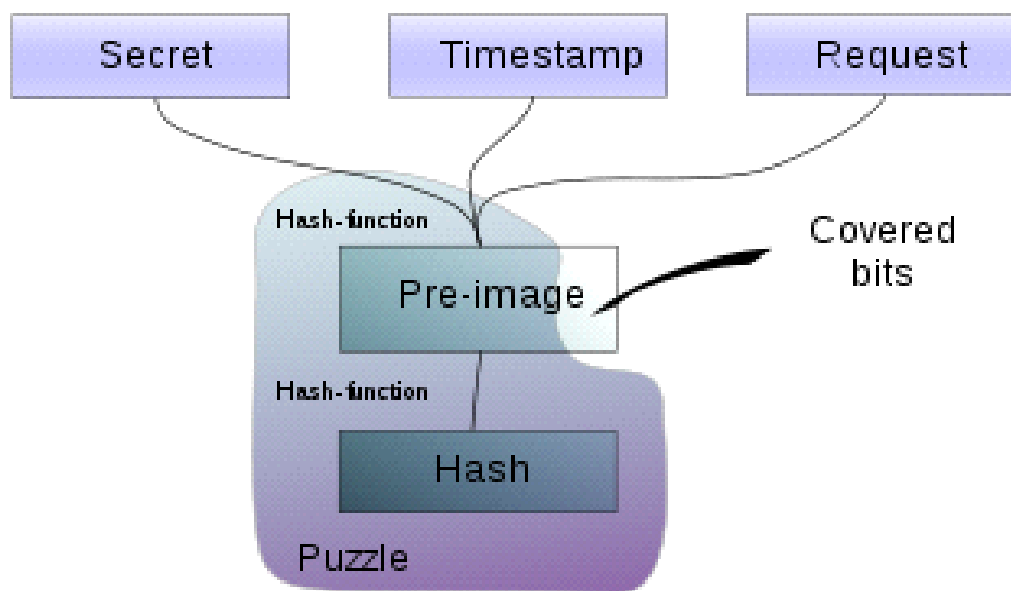


Fig.6.1: CPP algorithm

Client Puzzle Protocol (Fig 6.1) is a computer algorithm is use the goal of algorithm is to solve the graphical puzzle with in time limitation. After solving the puzzle the client should download the file which are requested. This method is used to fighting some types of spam as well as other attacks like Denial of Service.

7. TECHNOLOGY OVERVIEW

7.1 Microsoft Visual Studio 2012:

It is an IDE from Microsoft. Visual Basic Express 2012 has lots of new features than earlier version of VB. It is useful to develop the computer program, web application, web sites, web pages, web services and mobile apps. It supports for new project templates for building Metro UI apps for multiple devices.

7.2 SQL Server 2008 R2:

The back end technology will be SQL server 2008 R2. It is a server operating system produced by Microsoft. It can supports up to 64 physical processors or up to 256 logical processors per system. SQL Server Management Studio is an integrated environment for accessing, configuring, managing, and administering all components of SQL Server. Microsoft SQL Server 2008 R2 will provide support for geospatial visualization including mapping, routing, and custom shapes. SQL Server 2008 R2 provides lot many new features and capabilities for Business Intelligence users which can be leveraged by many organizations around the world.

8. MATHEMATICAL MODEL

$S = \{S, I, O, P, T, F, E\}$

S= Starting State.

I= Input State.

Client(c) request to the server(s) for service.

O= Output State.

Client get service in secure manner.

P= Process.

It should be puzzles in between client and server, shown by $P = p1; p2; p3::$

puzzle selection process in the network. C creation of access control between

C and S.

T= Check overall duration off puzzle solutions time(T) and security.

F= Failure.

When client should not solve puzzle in particular duration and doesnt get service from Server.

E= End State

9. RESULT:

Id	FileName	FilePath
1	06811189.pdf	Download
2	JavaBasics-notes.pdf	Download
3	JavaBasics-notes.pdf	Download
4	Assignment 2.pdf	Download
5	Assignment 2.pdf	Download
6	Assignment 2.pdf	Download
7	Assignment 2.pdf	Download
8	Assignment 2.pdf	Download
9	Java.rar	Download
13	teach_your_self_java_in_21_days.pdf	Download
14	DATA MINING 1.rar	Download
15	asp.net_tutorial.pdf	Download
16	dotNET Tutorial for Beginners.pdf	Download
17	Tourist Synopsis .docx	Download
18	Document.rtf	Download
19	sai.txt	Download
20	ram2.txt	Download
21	hilu.txt	Download

Fig 9.1: file Download

Enter Email ID

Enter Token

Fig 9.2: Enter Email and token for file Downloading

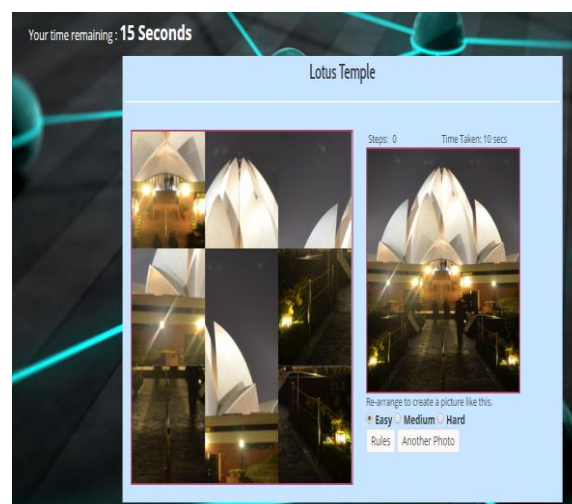


Fig 9.3: Puzzle Solving in time Limit

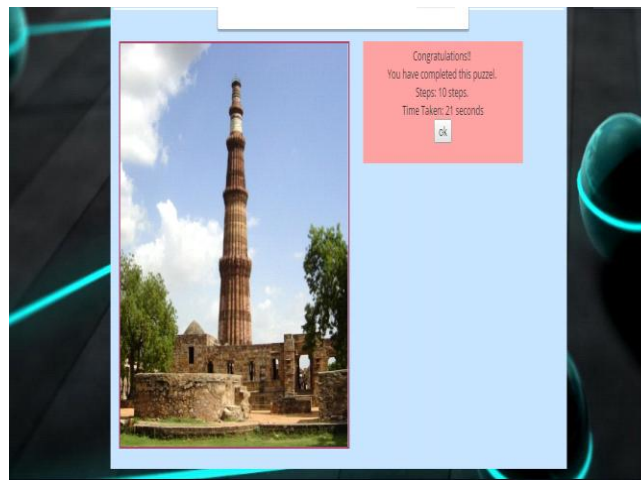


Fig 9.4:puzzle Solved

10. CONCLUSION

Software puzzle scheme is proposed for defeating GPU-inflated DoS attack. It adopts software protection technologies ensure challenged at a confidentiality and code security for an appropriate time period, e.g., 1-2 seconds. Hence, it has different security requirement from the conventional cipher which demands long-term confidentiality only, and code protection which focuses on long-term robustness against reverse-engineering only. Since the software puzzle may be built upon a data puzzle, it can be integrated with any existing server-side data puzzle scheme, and easily deployed as the present client puzzle schemes do. For example, suppose the server inserts some anti-debugging codes for detecting Cloudplatform into software puzzle, when the puzzle is running, the software puzzle will reject to carry on the puzzle-solving processing on Cloud environment such that the Cloud-inflated DoS attack fails. In the present software puzzle, the server has to spend time in constructing the puzzle. In other words, the present puzzle is generated at the server side. An open problem is how to construct the client-side software puzzle so as to save the server time for better defense performance. Another work is how to evaluate the effect of code de-obfuscation, which is related to the technology advance of code obfuscation.

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