Security Increases with Kerberos in Graphical User Authentication System

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Abstract—This paper present an authentication system which combine the graphical user authentication technique that is persuasive cued click point with the Kerberos which is the authentication protocol. With the addition of secret drawing in between Persuasive Cued Click Point (PCCP) technique, increases the security of overall system. In this system the password is the points on each image which is save in the database. Out of 10 images randomly 5 images is visible during each login time. In this way an attackers is fails to know the clicks point of 10 images .So it's hard for an attacker to login the system.. Additional security is provided with the help of Kerberos protocol which give the proper login to the system as well as other application. Our proposed system provides higher security than other graphical authentication systems.

Keywords- *Authentication, Graphical passwords, Hotspot, Kerberos , PCCP, Shoulder surfing*

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I.   INTRODUCTION

In early days, text based passwords are used to authenticate the user. Text based passwords are mainly contain a string of characters. The problem with text based passwords is that, peoples always creates password which is easy to remember but these password are easy for attackers to break. For more security, users use strong system assigned passwords which will be difficult for users to remember. Other authentication systems is design. One of them is Biometric and token but it has its own drawbacks such as it requires extra hardware so that these methods are not so effective. As an alternative solution, graphical passwords are used. Psychology studied reveals that human brain can recognize images better than the text. Graphical passwords are of three types: Click based graphical password scheme, choice based graphical password scheme and draw based graphical password scheme.

 Pass-Points: Pass-Point technique which comes under click based graphical password scheme. In Pass-Points technique password consists of sequence of 5 different click points on a one image. The main disadvantage of this scheme are HOTSPOTS problem and pattern formation attacks [2].

Cued Click Points: Cued Click Points comes under click-choice based graphical password scheme. Cued Click Points[2] was designed to reduce patterns formation attack and to reduce the usefulness of hotspots for attackers. Instead of five click-point on single image, CCP uses one click-point on five different images. The next image displayed is based on the location of the previously entered click-point. One best feature of Cued Click Point is that the message of authentication failure is displayed after the final click-point, to protect against incremental guessing attacks. But this technique has several disadvantages like false accept (the incorrect click point can be accepted by the system) and false reject (the click-point which is to be correct can be reject by the system).In this system pattern formation attack is reduced but HOTSPOT remains since users are selecting their own click-point. Persuasive Cued Click Points: Persuasive Cued Click Points technique comes under click-choice based graphical password scheme. By adding a persuasive feature to CCP,PCCP encourages users to select less predictable passwords, For password creation PCCP uses terms like viewport & shuffle. To avoid known hotspots the viewport is positioned randomly. The most useful advantage of PCCP is attackers have to improve their guesses.

Additional security in our proposed system is provided by Kerberos protocol [2] which is a computer network authentication protocol which works on the basis of "tickets" to allow nodes communicating over a non-secure network to prove their identity to one another in a secure manner. Its aimed is to provide   authentication. Kerberos protocol messages are protected against eavesdropping and replay attacks

II.   RELATED WORK

Here we present a comprehensive review of the few years of published research on graphical passwords, authentication system. Some of authentication systems are :-
A. Token based Methods

The usually used user name /password or personal identification number (PIN) based authentication scheme is an example of the Token Based. For example smart card, aadhar

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card etc. Then a user has to enter their user name/ password in order to obtain a token which allows them to fetch a specific resource- without using their user name and password.

B. Biometrics

Biometrics is the study of automated methods for uniquely recognizing human beings based upon one or more intrinsic physical or behavioral traits. It is based on "something you are". It uses behavioral characteristics like facial or fingerprint scans and iris or voice recognition to identify users.

Sonia Caisson, Elizabeth Stobert, Alai Forget,Robert Biddle, and Paul C. van Oorschot [3] describe the design and implementation of persuasive cued click point technique. In this paper they describe that PCCP work on the 5 images.

Sarisha Satheesan, A. Ilayarajaa [4] present a Sound Signature Integrated Graphical Password Authentication system. This system presents an modern idea that integrates graphical passwords with sound signature. The system allow the user to select click points on images as their passwords rather than textual words. According to human psychology, it can memorize the click points easily when compared to the textual passwords. The number of click points and the number of images included in the password creation depend upon the user's choice. Together with the system provides sound files that can be integrated to the user's password. While login, the system verifies the click points as well as the sound file also. Hence the system provides an effective method to create more secured passwords which are easier to manage and remember. This System is the integration of sound signature into graphical password scheme. The Graphical password scheme is very secure and difficult to hack and it is quite easy to remember.

Suresh Pagidala, C. Shoba Bindu [5] proposed a new click based graphical password scheme. In graphical user authentication system image can be used as password. But Image can be suffer with number of problem like hotspot problem and shoulder surfing problem. So hotspot problem can be remove completely with persuasive cued click point technique. To deal with shoulder surfing problem another method has been introduced called improved persuasive cued click point. This method is similar to the persuasive cued click

point but there is some change in the login phase of the method and also the concept of single and double clicks has been used. During a single click empty value has been accept and during the double click actual click point value has been accepted. So using this two types of click an attacker which is peeping over the shoulder of an authenticated user can get be confused and not get the exact click point values and in this way the shoulder surfing problem can be removed.

Pathan Mohd. Shafi, Dr Syed Abdul sattar, Dr. P. Chenna Reddy [6] describe a system in which security is the high priority issue. When security is high priority issue textual

based password is not enough there is a need of something more secure so the solution is an integration of cued click point technique in kerberoes authentication protocol. Kerberos credential will give the proper login to the system as well as their application. When the user want to login in the system user has to click on points system will be proceed if and only if all the click points are correctly selected and this process will be protected in the backend by the Kerberos protocol which will generated a ticket to authenticate the user.

In [7] image based authentication can be used for folder security. Folder may contain the confidential information. In this two techniques has been used PCCP i.e. persuasive cued click point and SHA1 i.e. secure hash algorithm. PCCP can be used to provide the better and strong password and SHA1 can be used to provide a better security to a folder. PCCP and SHA1 can provide an environment in which a folder will be in the safe condition. In this a software model has been design which provide the image based authentication as well as encrypting folder using the secure hash algorithm. Before encryption folder will be converted into zip file which does not allow to entering any viruses to the file make a damage in the file.

III. PROPOSED METHODOLOY

In this section we proposed a PCCP technique on 10 images. Further we implement the BDAS algorithm i.e. background draw a secret into the PCCP technique which increases the security of overall system. The techniques and algorithm used in our proposed system is discussed here.

A. Centered discretization algorithm

Centered Discretization algorithm improves the usability and security of our system. It offers centered-tolerance, which increases security because the size of grid squares can be reduced (to 2rx2r instead of 6rx6r), thereby increasing the password search space without negatively impacting usability since the same minimum tolerance r is guaranteed. It further increases usability by behaving in accordance with users'likely mental models and eliminating false rejects and false accepts.

B. Background DAS (BDAS)

This method was proposed in 2007. In this method both the background image and the drawing grid can be used to for drawng. User must have a secret in mind, and then draw it using the point from a given backgroundimage. The user's choice of secret is affected by various characteristic of the image.
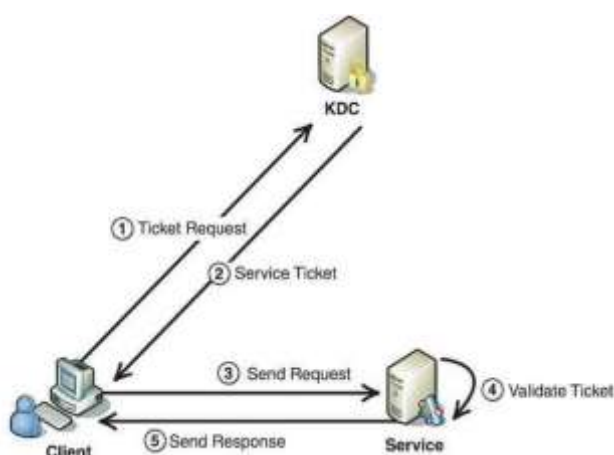
C. Persuasive cued click point technique(PCCP)

This is the graphical user authentication technique in which concept of viewport is introduced to avoid the known hotspot attack. User is allow to click inside the viewport only to choose the password. Persuasive Technology was first introduced by Fogg [14] as technology to motivate and convinced the people to behave in a desired manner. An authentication system which applies Persuasive Technology

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should guide and encourage users to select stronger passwords, but not impose system-generated passwords.

D. Kerberoes

Kerberos gets its name from Greek mythology. Cerberus, also known as Kerberos, was a three headed beast that guarded the Underworld and kept the living from entering the world of the dead Kerberos protocol design began in the late 1980s at the Massachusetts Institute of Technology (MIT), as part of project Athena. It is a secure authentication mechanism designed for systems, which assumes the network is unsafe. It enables a client and a server to mutually authenticate before establishing a connection.

IV. CONCLUSION

Now a day's data security is very important issue. Alphanumerical password has been used but it's not providing the efficient security in case when we chose the small password because it can be easily guessed or hacked by an attacker. Alternate solution is using a graphical user authentication system in which image can be used as a password. Our proposed graphical user password system can provide high security and usability. It can overcome with the hotspot and shoulder surfing problem. Graphical passwords have been introduced as an alternative to the traditional authentication process. Though the graphical password schemes provide a way of making more user friendly passwords, while increasing the level of security, they are vulnerable to shoulder surfing. Therefore, we have not only created a strong image based authentication system but also strengthen it with Kerberos authentication protocol. Since system can be integrated with any business or personal application, various appropriate modifications can be made in the system for future scope.

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