

Strengthening user authentication for better protection of mobile application systems

ABSTRACT

For most of us now, life is incomplete if living without mobile phones. This is because mobile phones are like a necessity to many people nowadays. Statistics have shown that more than seven billion people in the world are having these devices in 2015. This also means 97% of the human world populations are actually mobile phone users. Besides, more than 50% of the mobile phone users are using smart phones which are capable of downloading a lot of mobile application systems (apps). It is estimated that more than 200 million apps are being downloaded in 2007 and this number is believed to be growing. Unfortunately, many of these apps involve the transfer of important and confidential personal data or business information. How to ensure this sensitive information is well protected from being stolen or misused by unauthorized parties? One of the ways to secure this communication is to properly control the access to the system by strengthening the user authentication. Thus, this paper focuses on one of the techniques to enhance the protections of mobile apps to prevent intrusions by unpermitted users. The enhancement is focusing on improving the multi-factor elements and the text ciphering technique of the user authentication. In this study, random number and time are added in the existing text-based multifactor user authentication. Besides, encryption and hash are used as the text ciphering technique to improve the protection. To measure how secure the proposed enhancement is, an independent testing body has been appointed to perform Vulnerability Test and Functionality Test to the apps. If all these tests are passed, it can be said that the proposed enhancement is strong enough to protect the apps from being intruded. Based on the test results provided by the testing body, CyberSecurity Malaysia, the apps has passed all the Vulnerability Test and Functionality Test. This shows that the control of the access to these apps are strong and able to prevent from being accessed by unpermitted users. This also means the proposed enhancement is able to give better protections to ensure the mobile apps can't be easily broken into by unauthorized mobile phone users.

Keyword: User authentication; Data protection; Data transmission; Wireless communication; Mobile application systems