Evaluation for Combination of Shuffle and Diversity on Moving Target Defense Strategy for Cloud Computing

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Abstract

Moving Target Defence (MTD) has been recently proposed and is an emerging proactive approach which provides an asynchronous defensive strategies. Unlike traditional security solutions that focused on removing vulnerabilities, MTD makes a system dynamic and unpredictable by continuously changing attack surface to confuse attackers. MTD can be utilized in cloud computing to address the cloud's security-related problems. There are many literature proposing MTD methods in various contexts, but it still lacks approaches to evaluate the effectiveness of proposed MTD method. In this paper, we proposed a combination of Shuffle and Diversity MTD techniques and investigate on the effects of deploying these techniques from two perspectives lying on two groups of security metrics (i) system risk: which is the cloud providers' perspective and (ii) attack cost and return on attack: which are attacker's point of view. Moreover, we utilize a scalable Graphical Security Model (GSM) to enhance the security analysis complexity. Finally, we show that combining MTD techniques can improve both aforementioned two groups of security metrics while individual technique cannot.

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