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A Cost-Sensitive Move Selection Strategy for Moving Target Defense

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Abstract

The effectiveness and the cost-sensitivity of moving target defense (MTD) strategies have not been studied thoroughly in previous research. In this paper, we propose a hybrid MTD model that considers the defender's preferences to shift the attack surfaces more effectively in a cost-sensitive manner by incorporating event- and time-based move selection engines. We model the protected system as a state machine where the states are the attack surfaces with their security levels which are determined by utilizing the Bayesian attack graph (BAG) as a dynamic risk assessment tool. In the event-based engine, the competitive Markov decision process (CMDP) is employed to find the proper moves for each possible state of the protected system. Moreover, the

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