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A Comprehensive Survey of Ransomware Detection Techniques

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ABSTRACT

Ransomware is on the rise in the cyber world, causing significant financial and reputational losses to individuals and organizations around the world. Because it can hide sensitive information and demand ransom, strong analytical skills are needed. This research aims to demonstrate the current state of ransomware detection using traditional and machine learning methods. In this article, we examine the basic concepts, benefits, limitations, and emerging trends in ransomware detection, which are both traditional and machine learning based. Herein, we delve into core principles, advantages, limitations, and emerging trends on ransomware detection. We begin with traditional techniques, signature based, and heuristic-based techniques, which focus on known malware signatures and behavioral anomalies, respectively. Then comes analysis of the use of machine learning algorithms such as support vector machines, random forests, and neural networks to extract relevant features of malware samples and recognition of malicious intent. Finally, the survey settles on timely, continuous learning, and collaborations between security researchers as the best ways to combat the ever-increasing tactics resulting from time and technologies evolving in the case of an attack from ransomware. It aims to supplement the betterment of effective and resilient techniques for ransomware detection by analyzing the details in techniques that exist and emerging trends.

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